

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

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SCOPE AND GENERAL REQUIREMENTS

It is the intent of the ZIONSVILLE FIRE DEPARTMENT to secure an emergency apparatus to withstand the continuous use encountered in the emergency service. The apparatus shall be of the latest type, symmetrically proportioned and constructed with due consideration of the load to be sustained.

All parts not specifically mentioned herein, but which are necessary in order to furnish a complete emergency apparatus, shall be furnished and shall conform to the best practices known to the emergency industry.

The apparatus and all major components shall be manufactured in North America. Where the following detailed specifications require specific brand names, model number, dimension or capacities of components such as: axles, brakes, spring suspension, frame, steering gear, drive line, universal joints, engine transmission, alternator, batteries, air brake system, they have been specified for the service because of their reliability/availability of replacement parts on a local basis.

All specifications herein contained are considered as minimum. No exceptions to these minimum standards shall be allowed relating to gauge, alloy, and type of metal, size of compartments, and overall design.

The delivered apparatus shall have a certified G.V.W.R. weight sticker applied to vehicle on delivery to assure the apparatus meets all laws pertaining to the weight carrying capacity of the vehicle.

GENERAL CONSTRUCTION AND DESIGN

The design of the equipment shall be in accordance with the best engineering practices. The equipment design and accessory installation shall permit accessibility for use, maintenance and service. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks or other elements which might cause injury to personnel or equipment. All components shall be designed and protected so that heavy rains or other adverse weather conditions will not interfere with normal servicing or operation.

All oil, hydraulic and air tubing lines, and electrical wiring shall be located in protective positions properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members, except where a through frame connector is necessary.

The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles, so that all specified equipment including personnel will be carried without injury to the apparatus. All dimensions are approximate and subject to a plus or minus 1/4" tolerance.

The following specifications describe minimum requirements for an emergency services vehicle designed for severe duty applications.

The materials specified are considered absolute minimum.

Subletting any part of the fabrication, painting, or finishing of the apparatus will not be acceptable.

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ACCESSIBILITY

Parts and components shall be located or positioned for rapid and simple inspection and recognition of excessive wear or potential failure. Whenever functional layout of operating components determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be located for best accessibility.

Cover plates which must be removed for component adjustment or part removal should be equipped with quick disconnect fasteners or hinged panels.

Drains, filler plugs, grease fittings, hydraulic lines, bleeders, and check points for all components should be located so that they are readily accessible and do not require special tools for proper servicing. Design practices should minimize the number of tools required for maintenance.

MATERIALS

The materials specifications are considered absolute minimum. Materials shall conform to the specifications listed herein. When not specifically listed, materials shall be of the best quality for purpose of commercial practice. Materials shall be free of all defects and imperfections that might affect the serviceability of finished product.

QUALITY AND WORKMANSHIP

The manufacturing process, including quality control, shall be consistent with present industry standards. All equipment, material, and articles required under these specifications are to be new or fabricated from new materials produced from recovered materials. The term "Recovered Materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this document. The term "Heavy Duty", as used to describe an item, shall mean in excess of the standard, quantity, quality, or capacity and represents the best, most durable, strongest, etc., part, component, ZIONSVILLE FIRE DEPARTMENT system, etc., that is available. The ZIONSVILLE FIRE DEPARTMENT or their designate shall be the sole judge of quality, construction and stability of the apparatus and equipment being offered.

Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the ready removal of any component part for service or repair. All steel and stainless steel welding shall be done to American Welding Society D1.1-83 recommendations for structural steel welding. All aluminum welding shall be done to American Welding Society and ANSI D1.2-83 requirements for structural welding of aluminum.

Defective components shall not be furnished. Parts, equipment, and assemblies, which have been repaired or modified to overcome deficiencies, shall not be furnished without the approval of the ZIONSVILLE FIRE DEPARTMENT. Welded, bolted, and riveted construction utilized shall be in accordance with the highest standards of the industry. Component parts and units shall be manufactured to definite standard dimensions with proper fits, clearances, and uniformity. General appearance of the vehicle shall not show any evidence of poor quality of work.

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LIABILITY INSURANCE

Bidder shall furnish with the bid a certificate of insurance for;

Workman's Compensation and Employer's Liability Insurance covering all employees.

General Liability each occurrence of \$1,000,000.00, General Aggregate of \$2,000,000.00 including Products Completed / Operations Aggregate.

Personal Injury of \$1,000,000.00, Fire damage of \$50,000.00 and Medical expense of \$10,000.00. Automobile liability of \$1,000,000.00 combined single limit (each accident), including any auto, all owned autos, scheduled autos, hired autos, non-owned autos, and garage liability.

Excess Umbrella Liability coverage of \$2,000,000.00 each occurrence, Aggregate of \$2,000,000.00.

All insurance policies must be;

- Maintained for the life of the contract,
- Must provide ten (10) days notice before cancellation,
- Must cover all operations of the contractor, or anyone employed by them.

INTERNET IN-PROCESS SITE

The Body Manufacturer shall post and maintain a website where the ZIONSVILLE FIRE DEPARTMENT will be able to view digital images of their apparatus as its being manufactured. The digital images shall be posted once a week starting when the body begins production or when the cab/chassis arrives and shall continue until the final completion of the apparatus.

LEGAL REQUIREMENTS

The apparatus shall comply with all applicable federal and state or provincial laws and regulations.

PERSONNEL PROTECTION

Guards, shields, or other protection shall be provided where necessary in order to prevent injury of personnel by hot, moving, or rotating parts during non maintenance operations.

Electrical insulation or isolation shall be provided where necessary in order to prevent electrical shock from onboard electrical systems.

Vehicular workmanship shall ensure an operating environment free of accessible sharp projections and edges.

Safety-related (caution, warning, danger) signs shall meet the requirements of ANSI Z535.4, *Product Safety Signs and Labels*.

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CONTROLS AND INSTRUCTIONS

Illumination shall be provided for controls, switches, instruction plates, labels, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it.

If external illumination is provided, it shall be a minimum of 5 fc (50 lx) on the face of the device.

If internal illumination is provided, it shall be a minimum of 4 footlamberts (14 cd/m²).

All required signs, instruction plates, and labels shall be permanent in nature and securely attached and shall meet the requirements of NFPA and UL 969, *Standard for Marking and Labeling Systems*.

The signs, instruction plates, and labels shall have resistance to damage from temperatures between -30°F and 176°F (-35°C and 80°C) and exposure to oil, fuel, water, hydraulic fluids, or other fluids used on the apparatus.

The exterior mounted labels relating to safety or critical operational instructions shall be reflective or illuminated as required by NFPA.

The centerline of any gauge or visual display required by this standard shall be no more than 84 in. (2130 mm) above the level where the operator stands to read the instrument.

The central midpoint or centerline of any control shall be no more than 72 in. (1830 mm) vertically above the ground or platform that is designed to serve as the operator's standing position.

VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS

The cab/chassis shall be equipped with a stability control system. The system shall have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls.

WEIGHT DISTRIBUTION

When the fire apparatus is loaded to its estimated in-service weight, the front-to-rear weight distribution shall be within the limits set by the chassis manufacturer.

The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer under full load and all other loading conditions.

LOAD DISTRIBUTION

The apparatus manufacturer shall calculate the load distribution for the apparatus, and that load distribution plan shall be delivered with the fire apparatus.

The manufacturer shall engineer the fire apparatus to comply with the gross axle weight ratings (GAWR), the overall gross vehicle weight rating (GVWR), and the chassis manufacturer's load balance guidelines.

The fire apparatus, when loaded to its estimated in service weight, shall have a side-to-side tire load variation of no more than 7 percent of the total tire load for that axle.

Each tire shall be equipped with a visual indicator or monitoring system that indicates tire pressure.

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ROADABILITY

The apparatus, when loaded to its estimated in-service weight, shall be capable of the following performance while on dry, paved roads that are in good condition:

- (1) From a standing start, the apparatus shall be able to attain a speed of 35 mph (55 km/hr) within 25 seconds on a level road.
- (2) The apparatus shall be able to attain a minimum top speed of 50 mph (80 km/hr) on a level road.
- (3) The apparatus shall be able to maintain a speed of at least 20 mph (32 km/hr) on any grade up to and including 6 percent.

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

If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 mph (85 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

SERVICEABILITY

The fire apparatus shall be designed so that all the manufacturer's recommended routine maintenance checks of lubricant and fluid levels can be performed by the operator without lifting the cab of a tilt-cab apparatus or without the need for hand tools.

Where special tools are required for routine service on any component of the apparatus, such tools shall be provided with the apparatus.

Apparatus components that interfere with repair or removal of other major components shall be attached with fasteners, such as cap screws and nuts, so that the components can be removed and installed with ordinary hand tools. These components shall not be welded or otherwise permanently secured into place.

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CONSTRUCTION DOCUMENTATION

The contractor shall supply, at the time of delivery, at least one (1) copy of the following documents:

- (1) The manufacturers record of apparatus construction details, including the following information:
 - (a) Owner's name and address
 - (b) Apparatus manufacturer, model, and serial number
 - (c) Chassis make, model, and serial number
 - (d) GAWR of front and rear axles and GVWR
 - (e) Front tire size and total rated capacity in pounds (kilograms)
 - (f) Rear tire size and total rated capacity in pounds (kilograms)
 - (g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
 - (h) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
 - (i) Type of fuel and fuel tank capacity
 - (j) Electrical system voltage and alternator output in amps
 - (k) Battery make, model, and capacity in cold cranking amps (CCA)
 - (l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
 - (m) Ratios of all driving axles
 - (n) Maximum governed road speed
 - (o) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - (p) Pump transmission make, model, serial number, and gear ratio
 - (q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - (r) Water and Foam tank certified capacity in gallons or liters
 - (s) Paint manufacturer and paint number(s)
 - (t) Company name and signature of responsible company representative
 - (u) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
- (2) Certification of compliance of the optical warning system
- (3) Siren manufacturer's certification of the siren
- (4) Written load analysis and results of the electrical system performance tests
- (5) Certification of slip resistance of all stepping, standing, and walking surfaces
- (6) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability
- (7) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions
- (8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications
- (9) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed
- (10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test
- (11) If the apparatus has a fire pump, the certification of inspection and test for the fire pump
- (12) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test
- (13) When the apparatus is equipped with a water tank, the certification of water tank capacity
- (14) If the apparatus has an aerial device, the certification of inspection and test for the aerial device
- (15) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy and the final installer's certification the foam proportioning system meets this standard
- (16) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests
- (17) If the apparatus has a line voltage power source, the certification of the test for the power source

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- (18) If the apparatus is equipped with an air system, air tank certificates, the SCBA fill station certification (see 24.9.7), and the results of the testing of the air system installation
- (19) Any other required manufacturer test data or reports

OPERATIONS AND SERVICE DOCUMENTATION

The contractor shall deliver with the fire apparatus at least two (2) sets of complete operation and service documentation covering the completed apparatus as delivered and accepted.

The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof.

The contractor shall also deliver with the fire apparatus the following documentation for the entire apparatus and each major operating system or major component of the apparatus:

- (1) Manufacturer's name and address
- (2) Country of manufacture
- (3) Source for service and technical information
- (4) Parts replacement information
- (5) Descriptions, specifications, and ratings of the chassis, pump (if applicable), and aerial device (if applicable)
- (6) Wiring diagrams for low voltage and line voltage systems to include the following information:
 - (a) Pictorial representations of circuit logic for all electrical components and wiring
 - (b) Circuit identification
 - (c) Connector pin identification
 - (d) Zone location of electrical components
 - (e) Safety interlocks
 - (f) Alternator–battery power distribution circuits
 - (g) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems
- (7) Lubrication charts
- (8) Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
- (9) Precautions related to multiple configurations of aerial devices, if applicable
- (10) Instructions regarding the frequency and procedure for recommended maintenance
- (11) Overall apparatus operating instructions
- (12) Safety considerations
- (13) Limitations of use
- (14) Inspection procedures
- (15) Recommended service procedures
- (16) Troubleshooting guide
- (17) Apparatus body, chassis, and other component manufacturer's warranties
- (18) Special data required by this standard
- (19) A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

The contractor shall deliver with the apparatus all manufacturers' operations and service documents supplied with components and equipment that are installed or supplied by the contractor.

NFPA REQUIRED DOCUMENTATION FORMAT - CD-ROM

The vehicle construction details and the operations and service documentation as required per NFPA 1901 latest edition shall be provided on a CD-ROM. These manuals shall be divided into sections for ease of reference. There shall be two (2) copies of the CD-ROM provided with the completed vehicle.

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STATEMENT OF EXCEPTIONS

The contractor shall deliver with the fire apparatus either a certification that the apparatus fully complies with all requirements of this standard or, alternatively, a Statement of Exceptions specifically describing each aspect of the completed apparatus that is not fully compliant with the requirements of this standard at the time of delivery.

The Statement of Exceptions shall contain, for each noncompliant aspect of the apparatus or missing required item, the following information:

- (1) A separate specification of the section of the applicable standard for which compliance is lacking
- (2) A description of the particular aspect of the apparatus that is not in compliance therewith or required equipment that is missing
- (3) A description of the further changes or modifications to the delivered apparatus that must be completed to achieve full compliance
- (4) Identification of the entity that will be responsible for making the necessary post delivery changes or modifications or for supplying and installing any missing required equipment to the apparatus to achieve full compliance with this standard

Prior to, or at the time of, delivery of the apparatus, the Statement of Exceptions shall be signed by an authorized agent of the entity responsible for final assembly of the apparatus and by an authorized agent of the purchasing entity, indicating mutual understanding and agreement between the parties regarding the substance thereof.

An apparatus that is delivered subject to a Statement of Exceptions other than a certification of full compliance shall not be placed in emergency service until the apparatus has been modified as necessary to accomplish full compliance with this standard.

CARRYING CAPACITY

The GAWR and the GCWR or GVWR of the chassis shall be adequate to carry the weight of the completed vehicle when loaded to its estimated in-service weight. The manufacturer shall establish the estimated in service weight during the design of the vehicle

The estimated in-service weight shall include the following:

- (1) The chassis, body, and tank(s)
- (2) Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
- (3) Full water and other agent tanks
- (4) *250 lb (114 kg) in each seating position
- (5) Fixed equipment such as pumps, aerial devices, generators, reels, and air systems as installed
- (6) Ground ladders, suction hose, designed hose load in their hose beds and on their reels
- (7) An allowance for miscellaneous equipment that is the greatest of the values for type of vehicle per NFPA 1901, a purchaser provided list of equipment to be carried with weights, or a purchaser specified miscellaneous equipment allowance.

The manufacturer shall engineer and design the vehicle such that the completed unit, when loaded to its estimated in-service weight, with all movable weights distributed as close as is practical to their intended in-service configuration, does not exceed the GVWR.

A final manufacturer's certification of the GVWR or GCWR, along with a certification of each GAWR, shall be supplied on a label affixed to the vehicle.

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Apparatus Type	Equipmt. Storage Area	Apparatus Size	Equipment Allowance	
			lb.	kg.
Special Service Fire Apparatus	Minimum of 120 cu ft (3.4 cu mt) of enclosed compartmentation.	10,000 lb to 15,000 lb (4,500 kg to 7,000 kg) GVWR	2,000	910
		15,001 lb to 20,000 lb (7,001 kg to 9,000 kg) GVWR	2,500	1,135
		20,001 lb to 30,000 lb (9,001 kg to 14,000 kg) GVWR	3,000	1,350
		30,001 lb to 40,000 lb (14,001 kg to 18,000 kg) GVWR	4,000	1,800
		40,001 lb to 50,000 lb (18,001 kg to 23,000 kg) GVWR	6,000	2,700
		50,001 lb to 60,000 lb (23,001 kg to 27,000 kg) GVWR	8,000	3,600
		60,001 lb and up (27,001 kg) GVWR	10,000	4,500

TESTING

ROAD TEST

Road test shall be conducted in accordance with this section to verify that the completed apparatus is capable of compliance with Roadability Section.

The tests shall be conducted at a location and in a manner that does not violate local, state or provincial, or federal traffic laws.

The tests shall be conducted on dry, level, paved roads that are in good condition.

The apparatus shall be loaded to its estimated in service weight.

The engine shall not operate in excess of the maximum governed speed.

Acceleration tests shall consist of two runs in opposite directions over the same route.

The fire apparatus shall attain a speed of 35 mph (55 km/hr) from a standing start within 25 seconds.

The fire apparatus shall attain a minimum top speed of 50 mph (80 km/hr).

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

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If the apparatus is equipped with an air brake system, the service brakes shall bring the apparatus, when loaded to its GVWR, to a complete stop from an initial speed of 20 mph (32.2 km/hr) in a distance not exceeding 35 ft (10.7 m) by actual measurement on a paved, level, dry surface road that is free of loose material, oil, or grease.

If the apparatus is equipped with a hydraulic brake system, the service brakes shall bring the apparatus, when loaded to its GVWR, to a complete stop from an initial speed of 30 mph (48.2 km/hr) in a distance not exceeding 88 ft (26.8 m) by actual measurement on a paved, level, dry surface road that is free of loose material, oil, or grease.

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

The vehicles low voltage electrical system shall be tested and certified by the manufacturer. The certified test results shall be delivered with the completed vehicle. Tests shall be performed when the air temperature is between 0°F and 110°F (–18°C and 43°C).

TEST SEQUENCE

The following three (3) tests shall be performed in the order in which they appear below. Before each test, the batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10 minutes. Failure of any of these tests shall require a repeat of the sequence.

(1) RESERVE CAPACITY TEST

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off, and the minimum continuous electrical load shall be activated for 10 minutes.

All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure of the battery system.

(2) ALTERNATOR PERFORMANCE TEST

TEST AT IDLE

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

TEST AT FULL LOAD

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test.

An alarm sounded by excessive battery discharge, as detected by the warning system required in 13.3.4, or a system voltage of less than 11.8 V dc for a 12 V nominal system, 23.6 V dc for a 24 V nominal system, or 35.4 V dc for a 42 V nominal system for more than 120 seconds shall be considered a test failure.

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(3) LOW VOLTAGE ALARM TEST

The following test shall be started with the engine off and the battery voltage at or above 12 V for a 12 V nominal system, 24 V for a 24 V nominal system, or 36 V for a 42 V nominal system.

With the engine shut off, the total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals.

The test shall be considered a failure if the alarm does not sound in less than 140 seconds after the voltage drops to 11.70 V for a 12 V nominal system, 23.4 V dc for a 24 V nominal system, or 35.1 V for a 42 V nominal system.

The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

- (1) Documentation of the electrical system performance tests
- (2) A written electrical load analysis, including the following:
 - (a) The nameplate rating of the alternator
 - (b) The alternator rating
 - (c) Each of the component loads specified that make up the minimum continuous electrical load
 - (d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load
 - (e) Each individual intermittent electrical load.

UL 120/240 VAC CERTIFICATION

The 120/240 volt electrical system shall be tested and certified by Underwriters Laboratories, to perform as listed below;

The prime mover shall be started from a cold start condition, and the unloaded voltage and frequency shall be recorded.

The line voltage electrical system shall be loaded to at least 100 percent of the continuous rated wattage stated on the power source specification label. Testing with a resistive load bank shall be permitted.

The power source shall be operated in the manner specified by the apparatus manufacturer as documented on instruction plates or in operation manuals. The power source shall be operated at a minimum of 100 percent of the continuous rated wattage as stated on the power source specification label for a minimum of 2 hours.

The load shall be adjusted to maintain the output wattage at or above the continuous rated wattage during the entire 2-hour test.

The following conditions shall be recorded at least every 1.2 hour during the test:

- (1) The power source output voltage, frequency, and amperes
- (2) The prime mover's oil pressure, water temperature, and transmission temperature, if applicable
- (3) The power source hydraulic fluid temperature, if applicable
- (4) The ambient temperature and power source air inlet temperature

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The following conditions shall be recorded once during the test for power sources driven by dedicated auxiliary internal combustion engines:

- (1) Altitude
- (2) Barometric pressure
- (3) Relative humidity

If the generator is driven by the chassis engine and the generator allows for operation at variable speeds, the chassis engine speed shall be reduced to the lowest rpm allowed for generator operation and the voltage and frequency shall be recorded.

The load shall be removed, and the unloaded voltage and frequency shall be recorded.

Voltage shall be maintained within ± 10 percent of the voltage stated on the power source specification label during the entire test. Frequency shall be maintained within ± 3 Hz of the frequency stated on the power source specification label during the entire test.

The total continuous electrical loads, excluding those loads associated with the equipment defined in 22.15.7.3.11.2, shall be applied during the testing unless an auxiliary engine drives the power source.

If the apparatus is equipped with a fire pump, the 2-hour certification test of the power source shall be completed with the fire pump pumping at 100 percent capacity at 150 psi (1000 kPa) net pump pressure. The test shall be permitted to be run concurrently with the pump certification test.

The results of each test shall be recorded on an appropriate form and provided with the delivery of the fire apparatus.

DIELECTRIC VOLTAGE WITHSTAND TEST

The line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for 1 minute. The testing shall be performed after all body work has been completed.

The test shall be conducted as follows:

- (1) Isolate the power source from the panel board and disconnect any solid state low voltage components.
- (2) Connect one lead of the dielectric tester to all the hot and neutral buses tied together.
- (3) Connect the other lead to the fire apparatus frame or body.
- (4) Close any switches and circuit breakers in the circuit(s).
- (5) Apply the dielectric voltage for 1 minute in accordance with the testing equipment manufacturer's instructions.

The electrical polarity of all permanently wired equipment, cord reels, and receptacles shall be tested to verify that wiring connections have been properly made.

Electrical continuity shall be verified from the chassis or body to all line voltage electrical enclosures, light housings, motor housings, light poles, switch boxes, and receptacle ground connections that are accessible to fire fighters in normal operations.

If the apparatus is equipped with a transfer switch, it shall be tested to verify operation and that all non grounded conductors are switched.

Electrical light towers, floodlights, motors, fixed appliances, and portable generators shall be operated at their full rating or capacity for 30 minutes to ensure proper operation.

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LOW VOLTAGE ELECTRICAL SYSTEM - FIVE (5) YEARS

Contractor shall warrant the integrity of the electrical system on this emergency vehicle for a period of **five (5) years, or 60,000 miles** from date of delivery. To be free from defects in materials and workmanship under normal use and service. The obligation of contractor under this warranty is limited to repairing or replacing, at its option, any part or parts thereof which shall, after delivery of such vehicle to the original purchaser, be returned with transportation charges pre-paid to contractor or an authorized distributor or dealer, and which examination shall disclose to have been defective, except as herein after provided.

Items specifically covered are:

- Electrical harness and harness installation
- Printed circuit boards
- Load management system
- Warning light control panel switches that are provided and installed by bidder.

Items excluded are:

- Chassis electrical systems and components installed by chassis manufacturer including, but not limited to: printed circuit boards, switches, relays, fuses, and similar equipment.
- Separately manufactured items installed by bidder including, but not limited to: batteries, sirens, battery chargers, inverters, light bars and similar equipment. These are covered by warranties supplied by the manufacturer of the components.
- Periodic tightening and cleaning of connection terminals as this is considered routine maintenance.
- Normal wear, abuse, accident, negligence or unapproved alteration of original parts.

PAINT WARRANTY - TEN (10) YEARS

The exterior paint and finish on the portion of the unit painted by the contractor shall be warranted against cracking, checking, hazing, chalking, or fading or peeling of the topcoat or any layers from the substrate due to defects in manufacturing or improper preparation for a period of **Ten (10) years** from acceptance.

CONSTRUCTION PERIOD

The completed vehicle shall be delivered within three hundred sixty five (365) days after receipt of a purchase order, or contract.

Contractor shall not be held liable for delays of chassis delivery due to accidents, strikes, floods or other events not subject to their control. Contractor shall provide immediate written notice to ZIONSVILLE FIRE DEPARTMENT as to delays and to what extent these delays have in completing vehicle within the stated construction time period.

OVERALL HEIGHT

The overall height (OAH) of the vehicle shall be approximately (10' - 10") from the ground. This measurement shall be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

OVERALL LENGTH

The overall length (OAL) of the vehicle shall be approximately (40' - 10").

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INSPECTION TRIPS

The Body Manufacturer will provide three (3) factory inspection trips for the ZIONSVILLE FIRE DEPARTMENT's representatives to the Body Manufacturer's factory. Transportation, meals, lodging and other requisite expenses will be the Body Manufacturer's responsibility.

Inspection trips to the Body Manufacturer's factory will occur as follows:

- Pre-construction trip for four (4) ZIONSVILLE FIRE DEPARTMENT's representatives.
- Pre-paint inspection trip for (2) ZIONSVILLE FIRE DEPARTMENT's representatives
- Final inspection trip for three (3) ZIONSVILLE FIRE DEPARTMENT's representatives.

SHOP NOTES

The Fire Co. will be responsible for trips.

DELIVERY AND DEMONSTRATION

The contractor shall be responsible for the delivery of the completed unit to the ZIONSVILLE FIRE DEPARTMENT's location. On initial delivery of the apparatus, the contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the ZIONSVILLE FIRE DEPARTMENT regarding the operation, care, and maintenance of the apparatus and equipment supplied at the ZIONSVILLE FIRE DEPARTMENT's location.

The delivery engineer shall set delivery and instruction schedule with the person appointed by ZIONSVILLE FIRE DEPARTMENT.

After delivery of the apparatus, the ZIONSVILLE FIRE DEPARTMENT shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment as defined in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, and NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

SHOP NOTES

The Fire Company will be responsible for delivery/demo.

MODEL

The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. This chassis shall be manufactured for heavy duty service with strength and capacity for a duty rating of one hundred (100) percent loaded full time.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2009 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of United States of America (USA).

APPARATUS TYPE

The apparatus shall be a rescue vehicle designed for emergency service use which shall include the functions of a multipurpose vehicle which primarily provides support services at emergency scenes.

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VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION

The chassis shall feature a 6 X 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be 23,000 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 44,000 pounds.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

CAB STYLE

The cab shall be a custom, enclosed model, built specifically for the fire service by a company specializing in cab and chassis design for all fire service applications.

The cab shall be manufactured for heavy-duty service utilizing adequate strength and capacity for the application of protecting firefighters. The cab shall be of a modular design offering improved strength, durability and reduced weight. The modular design shall allow for faster, less costly replacement of components. Per pound, sheet panel aluminum extrusions offer a higher tensile strength, 45,000 PSI, and yield strength, 40,000 PSI, than that of lower grade sheet such as 3003-H13. For this reason, the cab shall be of aluminum extrusion construction, which shall offer superior strength and the truest, flattest surface ensuring less expensive paint repairs if needed.

The method of cab construction shall use a process incorporating techniques outlined in accordance with the American Welding Society D1.1-96 requirements for structural steel welding. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side panels shall be assembled using proven industrial adhesives, designed specifically for aluminum fabrication, which exceed the strength of a weld, for construction.

All interior and exterior seams shall be sealed for optimum noise reduction in addition to the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 Marine Grade, one hundred percent primary aluminum plate. A single formed, one (1) piece extrusion, manufactured from 6061-T6 100 percent primary one- quarter inch thick aluminum shall be used for the "A" pillar adding strength and rigidity to the cab as well as additional roll-over protection. The cab side wall skins and shall be 0.125 inch thick, the rear wall and roof skin shall be 0.19 inch thick, the front skin shall be 0.125 inch thick.

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The cab shall incorporate tongue and groove fitted 6061-T6 0.25 inch thick aluminum extrusions for extreme duty situations. The cab shall include multi-layer composite insulation for improved cab heating and cooling in addition to noise reduction.

Proposals offering products built with anything less than the alloy-temper mentioned or from any other material, other than aluminum, shall not be considered. Additionally, any cabs utilizing recycled or recovered aluminum plate or extrusion products shall not be considered due to impurities in the composition leading to a lack of strength.

The cab shall incorporate a fully enclosed design, allowing for a spacious cab area with no partition between the front and rear sections of the cab. The walls of the vehicle shall include roof supports allowing for an open design. The outside dimension of the cab shall be 96 inches wide with a minimum interior width of 90 inches.

The cab overall length shall be 150.38.00 inches in length with 74.00 inches from the centerline of the front of the axle to the back of the cab. The cab shall offer an interior height of 58.00 inches from the front floor to the headliner and a rear floor to headliner height of 75.00 inches in the crew area, at a minimum. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

In order to offer the optimum amount of cab space to occupants, there shall be no consideration given for any cab unable to comply with the minimum measurements for interior cab space as listed.

The cab shall include a driver and officer area with two (2) cab door openings. The front door opening shall offer a clear door opening of 43.00 inches wide X 56.00 inches high. The rear door opening shall offer a clear door opening of 34.00 inches wide X 84.00 inches high. This style of cab shall also include a crew area offering up to ten (10) seating positions.

The cab shall incorporate a (2) step configuration from the ground to the cab floor for each door opening. The lower step shall be constructed of heavy duty safety grating which meets or exceeds Federal Specification RRG-1602-latest revision and performs under dry, greasy, muddy, soapy and icy conditions and offers open drainage.

The first step for the driver and officer area shall measure 11.44 inches deep X 31.13 inches wide. The intermediate step shall measure 8.75 inches deep X 33.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure 12.13 inches deep X 20.44 inches wide. The intermediate step shall measure 10.50 inches deep X 23.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.50 inches.

CAB FRONT FASCIA

The front cab fascia shall be the Evolution style, constructed of lightweight, impact resistant fiberglass reinforced plastic which shall be attached to the front cab skin to offer an appealing exterior. The cab fascia will encompass the front of the aluminum cab structure from the bottom of the windshield to the lower section of the cab.

The fascia shall include modules for two (2) single Hi/Low beam headlamps with integrated side turn/marker light assemblies. The hinged modules shall permit easy access for maintenance of the light assemblies as well as access to the engine air intake ember separator, the electrical bulkhead connections, and the transmission electronic communications module. Stylized louvers are incorporated into the design of the fascia to enhance air flow to the cooling system.

The Evolution fascia shall also provide two (2) warning light positions below each of the headlamp modules for the installation of up to four (4) warning lights on the front cab fascia.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

FRONT GRILLE

The fascia shall include a (2) piece hinged, stainless steel raised front grille 40.00 inches wide x 31.95 inches height X .88 inches deep. The grille shall include a minimum free air intake of 519.30 square inches shall be installed on the front of the cab fascia. The upper portion of the grille will be hinged and will have (2) flush push button latches that allow access to the front fluid fills of the cab.

CAB ENGINE TUNNEL

The cab interior shall include a fixed type engine tunnel cover sized to accommodate an engine with a smaller block or an engine which has a large block. The engine tunnel shall be an integral part of the cab constructed of 5052-H32 Marine Grade, .190 of an inch thick, one hundred percent primary aluminum plate. The tunnel shall be a maximum of 41.50 inches wide X 29.00 inches high.

The engine tunnel shall be insulated with multi-layer insulating material, consisting of foam, a sound barrier of 1.0 pounds per square foot with a facing which resists heat transfer. This insulation shall be held in place by adhesive, aluminum stick pins and retention caps. Any exposed insulation seams and edges shall be sealed reducing moisture and debris.

CAB ENTRY DOORS

The cab shall include a driver and officer area with two cab door openings which offer a clear door opening of 40.75 inches wide.

The doors shall be constructed of extruded aluminum with a nominal thickness of .125 inch. The exterior skins shall be constructed of .125 inch aluminum plate. The cab shall include four (4) entry doors as high as possible for ease of entering and egress when outfitted with an SCBA.

All cab and crew doors shall be of substantial weight for the optimum strength and rigidity for the best performance in all cab crash testing. Any cab with front and crew doors manufactured of less than the material thickness of .125 inch in both the extrusion and exterior skin shall not be considered.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each hinge shall be .375 inch piano style and be constructed of stainless steel.

The piano style hinge and hidden flush mounted door is the most favorable construction keeping dirt and debris out of the hinge allowing for optimum operation throughout the lifetime of the door.

Proposals offering door hinge thickness any less than stated shall not be considered.

Proposals including doors that do not comply with the flush mounting as described or those including exposed hinges shall not be considered.

CAB ENTRY DOOR TYPE

All entry doors shall be of a flush, full height design and shall be located on the sides of the cab.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

LH EXTERIOR REAR COMPARTMENT

The cab shall contain an exterior compartment on the left side of the cab behind the rear door. The compartment opening shall be 16.25 inches wide X 78.00 inches high. The compartment size shall be 17.84 inches wide X 78.00 inches high X 21.19 inches deep.

The compartment shall include a 17.13 inches wide, 78.00 inches high and 1.50 inches thick reverse hinged box pan style flush mount door with a locking bent D-ring slam latch with door switch to activate the open compartment warning light in the cab and the lights inside the compartment.

LH EXTERIOR REAR COMPARTMENT LIGHTING

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the exterior rear compartment on the left side of the cab. The strip light shall be 43" long and shall include twelve (12) bright white Gen3 LEDs for long life and low amp draw.

LH EXTERIOR COMPARTMENT INTERIOR FINISH

The interior of the left hand exterior compartment shall have a DA sanded finish.

RH EXTERIOR REAR COMPARTMENT

The cab shall contain an exterior compartment on the right side of the cab behind the rear door. The compartment opening shall be 16.25 inches wide X 21.19 inches high. The compartment size shall be 17.84 inches wide X 21.19 inches high X 21.19 inches deep. The compartment shall include a 17.13 inch wide, 32.00 inch high and 1.50 inch thick hinged box pan style flush mount door with a locking bent D-ring slam latch. There shall be a switch to activate the open compartment warning light in the cab in the event the door is left ajar.

RH EXTERIOR REAR COMPARTMENT LIGHTING

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the exterior rear compartment on the right side of the cab. The strip light shall be 10" long and shall include three (3) bright white Gen3 LEDs for long life and low amp draw.

RH EXTERIOR COMPARTMENT INTERIOR FINISH

The interior of the right hand exterior compartment shall have a DA sanded finish.

CAB STRUCTURAL WARRANTY

The cab structure shall be warranted for a period of ten (10) years. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CAB TEST INFORMATION

The cab shall have successfully achieved survival of the International crash test ECE-29, Addendum 28, Revision 1 as indicated below.

As part of the ECE regulation 29 test, the frontal area of the cab is struck by a 3,700 pound pendulum weight. The weight is brought back to a sixty degree angle and then the weight is released and allowed to swing forward, imparting some 32,600 lbs/ft of force to the cab front face.

The cab shall be so constructed that after the test, there will be minimal intrusion of the cab structure into the passenger area. The doors shall remain usable for both entry and exit. Also, as part of the test the cab roof must withstand a static load bearing test. The cab shall withstand a weight of over 60,000 pounds without permanent damage or collapse.

The above tests shall be witnessed by and attested to by an independent third party. The test results shall be recorded on/by cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

CAB PAINT EXTERIOR

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper, the seams shall be sealed with SEM brand seam sealer and painted with two (2) to four (4) coats of an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene.

The cab shall then be painted with the upper and lower colors specifically designated by the customer with a minimum thickness of two 2.00 mils of paint, followed by a clear top coat not to exceed 2.00 mils.

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint.

CAB PAINT PRIMARY/LOWER COLOR

The lower paint color shall be PPG FBCH 77723 red.

CAB PAINT SECONDARY/UPPER CAB COLOR

The upper paint color shall be PPG FBCH 2185 White.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet at a break line on the cab which shall fall approximately 1.00 inch below the cab door windows and above the exterior door handles on the sides of the cab. On the front of the cab the break line shall parallel the body line on the cab fascia below the windshield wipers and above the headlamps until the breakline meets the cab grille at the corners of the grille just above the access hinge.

CAB PAINT PINSTRIPE

Where the upper and lower paint colors meet a temporary 0.50 inch black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM.

CAB PAINT WARRANTY

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for 10 years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon brand of multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

APPARATUS WIRING PROVISION

An apparatus wiring panel shall be installed on the officer side bulkhead below the dash which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp, three (3) 10 amp, and one (1) 15 amp circuit, with relays and breakers with trigger wires which shall be routed to the rocker switch panel.

MULTIPLEX DISPLAY

The multiplex electrical system shall include two (2) Weldon Vista III Touchscreen displays which shall be located one (1) on the left side dash in the switch panel and one (1) on the right side of the dash in the switch panel. The Touchscreen displays shall feature full color LCD display screens. The display shall include a message bar displaying the time of day, and important messages requiring acknowledgement by the user. There shall be virtual controls for the auto climate control and on-board diagnostics. The display screens shall be video ready for back- up cameras, thermal cameras, and DVD. A DIN type input connector ready for GPS interfacing shall be incorporated into the back of the display.

The Touchscreen displays shall measure approximately 6.25 inches wide x 3.38 inches in height. The displays shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

VEHICLE DATA RECORDER

The chassis shall have a Weldon Vehicle Data Recorder system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

POWER & GROUND STUD

A 40 amp battery direct power and ground stud shall be provided and installed in the electrical distribution panel. The stud shall be size #10 and protected with a 40 amp circuit breaker.

AUXILIARY POWER & GROUND STUD

An auxiliary set of power and ground studs shall be provided and installed behind the electrical center cover with a 40 amp breaker. The studs shall be .375 inch diameter and capable of carrying up to a 40 amp load switched with the master power switch.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a yellow protective rubberized coating to prevent corrosion.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ENGINE

The power plant for the vehicle shall offer a high pressure performance, turbo charged engine which shall feature a high pressure common rail fuel system. This system shall be coupled with a proven Holset turbo which delivers outstanding performance at ratings up to 450 HP. The Cummins ISM engine shall include replaceable mid-stop cylinder liners plus heavy duty roller followers, targeted piston cooling and 30% more efficient oil cooling for improved durability and reliability. The heavy duty design shall also feature stronger braking capacity.

The engine shall be EPA certified to meet the very latest emissions standards without compromising performance, reliability or durability. The Cummins ISM 450 engine shall feature an air charge cooled engine which consists of an in line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse power at 2000 RPM which shall be governed at 2100 RPM. The torque rating shall feature 1550 foot pounds of torque at 1200 RPM with 661 cubic inches of displacement. The Cummins ISM 450 engine shall feature an electronic governor.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indication on the Vista screen for the high idle speed control.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

The engine shall include programming which will govern the top speed of the vehicle.

AUXILIARY ENGINE BRAKE

A Jacobs engine compression brake, for the six (6) cylinder engine shall be provided. The engine compression brake shall actuate the vehicle's brake lights when engaged. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine brake shall activate upon 0% accelerator when in operation mode.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

AUXILIARY ENGINE BRAKE CONTROL

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.

- The driver has requested or enabled engine compression brake operation.

- The throttle is at a minimum engine speed position.

- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

- There is no active ABS event.

The compression brake shall be controlled through an off/low/high rocker on the dash.

FLUID FILLS

The front of the chassis shall accommodate fluid fills for the engine oil and the windshield washer fluid through the grille. This area shall also accommodate checks for the engine oil.

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discrete wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discrete wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall be direct drive belt driven on the engine.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the fire industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall utilize heavy-duty welds and be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a stacked, single depth package that provides the maximum cooling capacity for the specified engine as well as offers excellent serviceability. The main components shall include a surge tank, a charge air cooler, a recirculation shield, and a radiator.

There shall be a single depth core that allows greater efficiency, enhanced serviceability, and lighter weight with a higher ambient capability.

The cooling package core shall be protected by a radiator skid plate and not protrude below the frame of the vehicle by more than 3.5 inches. This feature shall provide an improved angle of approach thereby reducing possible damage.

The radiator shall be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator shall include a minimum of a 910 square inch core and shall be bolted to the bottom of the charge air cooler to allow a single depth core, thus allowing a more efficient and serviceable cooling system. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injected molded Polymer fan blade designed to provide long life in harsh environments. Polymer fans provide a significant weight reduction over metal fans providing longer life for fan clutch linings and bearings along with increased fan belt life.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a cap that meets the engine manufacturer's pressure requirements as well as the system design requirements.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance. When a center bumper compartment is installed an additional shield may be required to redirect the airflow into the coolers.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with welded side tanks. The charge air cooler shall have a minimum of a 473 square inch core and be bolted to the top of the radiator to allow a single depth core, thus allowing a more efficient and serviceable cooling system.

All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees F.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ENGINE COOLANT FILTER

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator air intake filter which shall be located in the front of the cab behind the officer side fascia. This filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a galvanized steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The engine shall also include an air intake filter which shall be bolted to the frame and located under the front of the cab on the officer side. The completely disposable dry type filter shall ensure containment of dust and debris safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal.

The air flow distribution and dust loading shall be uniform throughout the high-performance filter cone pack, which shall result in increased capacity and lower pressure differential for improved horsepower and fuel economy. The air intake shall be mounted within easy access via a hinged panel behind the headlight module. The air intake system shall include a restriction indicator light in the warning light cluster which shall activate when the air cleaner element requires replacement.

The charge air cooler hose shall be formed from aluminized steel tubing and include silicone hump hose with stainless expansion rings and stainless steel "constant torque" style clamps meeting the engine manufactures requirements.

Proposals shall include an indication light representative of the need for replacement of the air intake filter and shall be located at the front of the vehicle.

AIR INTAKE SKIDPLATE

A skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall be bolted to the bottom flange of the right side frame rail to provide additional protection for the air intake system.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ENGINE EXHAUST SYSTEM

The exhaust system shall be installed under the frame and shall terminate horizontally on the officer side of the vehicle ahead of the rear tires. A muffler and 0.065 wall aluminized steel exhaust tubing shall be installed. The tubing shall be supported by brackets which are bolted to the frame for strength and rigidity. Stainless steel flex tubing shall be installed between exhaust pipe and the muffler system. Any joints throughout the system shall be connected with overlapping band style clamps.

ENGINE EXHAUST ACCESSORIES

The exhaust system shall be modified to accept a Plymovent exhaust extraction system collar.

TRANSMISSION

The drive train shall include an Allison Gen IV-E model EVS 4000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The Gen IV-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

The transmission gear ratios shall be:

1st - 3.51:1

2nd - 1.91:1

3rd - 1.43:1

4th - 1.00:1

5th - 0.74:1

6th - 0.64:1 (if applicable)

Rev- 4.80:1

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will select a six (6) speed operation without the need to press the mode button.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

TRANSMISSION FEATURE PROGRAMMING

The EVS group package number 127 shall contain the 199 vocational package in consideration of the duty of this apparatus for rescue. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

An 8 pin Delphi connector will be provided next to the steering column connector. This will contain the following input/output circuits to the transmission tcm.

Function ID	Description	Wire assignment
C	PTO Request	143
F	Aux. Function Range Inhibit (Special)	101/142
G	PTO Enable Output (See Input Function C)	130
S	Neutral Indicator for PTO	145
	Signal Return	103

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector will provide a prognostic indicator (wrench symbol) between the selected and attained indicators.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

TRANSMISSION COOLING SYSTEM

The transmission shall include an air to oil cooler integrated into the lower portion of cooling package. The transmission cooling system shall meet all transmission manufacturer requirements. The cooling system shall feature a circuit provision located within the hydraulic transmission oil which shall provide for rapid warm up to the optimum transmission operating temperature.

Proposals offering water to oil style transmission cooling systems shall not be accepted.

LH PTO

A Spartan supplied ten (10) bolt standard duty clutched drive PTO shall be installed on the transmission. Installation shall include mounting of the PTO and wiring the unit with a control switch.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

LH PTO MODEL

A ten (10) bolt Chelsea model 277-XGFJP-B5XD heavy duty transmission driven PTO shall be installed. The clutched shifted PTO is designed specifically for the Allison world transmission and provides torque ranges from 250 to 335 lb. ft.

PTO LOCATION

The transmission driven power take off (PTO) shall be mounted in the 8:00 o'clock position.

PTO CONTROL

The left hand power take off shall be controlled by the transmission. It will use a virtual switch on vista with text messages. Disable is displayed when switch is off. Enable is displayed when the switch is turned on. Active is displayed when the switch is on with positive engagement of the power take off.

Required operating conditions for enabling this function are:

Throttle position is low

Engine speed is within customer modifiable constant limits

Output speed is within customer modifiable constant limits

Park brake set

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. A splined slip joint shall be provided in each driveshaft and shall be coated with Glide coat®.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a fuel filter/water separator as a primary filter as approved by the engine manufacturer.

FUEL LINES

The fuel system lines shall be black textile braid covered high tensile steel reinforced wire braided supply and return hoses with steel reusable fittings installed from the tank to engine.

FUEL SHUTOFF VALVE

A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

A second fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

ELECTRIC FUEL PRIMER

A Facet brand electric fuel primer pump shall be provided and include a fuel primer momentary switch located on a panel under the dash to activate the primer pump. A check valve and by-pass system shall be installed for normal draw of fuel for the engine fuel pump.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

FUEL TANK

The fuel tank shall have a minimum capacity of sixty-eight (68) gallons and measure 35.00 inches wide X 17.00 inches high X 29.00 long. The baffled tank shall be made of 14 gauge aluminized steel. The tank exterior is painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The fuel tank shall be mounted 2.00 inch below the frame, behind the rear axle. The tank can be easily lowered and removed for service purposes.

The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

Dual draw tubes and dual sender ports shall be installed. A 2.00 inch NPT fill ports shall be available for right or left hand fill. A 0.5 inch NPT drain plug shall be centered in the bottom of the tank.

FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with the right fill port located in the middle position and the left fill ports located one (1) in the forward position and one (1) in the middle position of the fuel tank.

FUEL TANK SERVICEABILITY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8 ft. of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FRONT AXLE

The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-23. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle. The weight capacity for the axle shall be rated to 23,000 pounds. This rating shall require special approvals from the wheel manufacturers.

FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with clear oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

FRONT SHOCK ABSORBERS

Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and "road sensing" shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

Proposals offering the use of conventional twin tube or "road sensing" designed shocks shall not be considered.

FRONT SUSPENSION

The front suspension shall include nine (9) leaf, 53.38 inch long and 4.00 inches wide taper leaf springs with a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 23,000 pounds.

STEERING COLUMN/ WHEEL

The cab shall include a Douglas Autotech steering column shall be a seven (7) position tilt and 2.25 inch telescopic type with an 18.00 inch steering wheel located on the left side of the cab designating the driver's position. The steering wheel shall be covered with black absorbite padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

POWER STEERING PUMP

The hydraulic power steering pump shall be a Vickers 20V and shall be gear driven from the engine. The pump shall be a fixed displacement vane type.

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 48 degrees to the left and 44 degrees to the right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85 with an assist cylinder.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CHASSIS ALIGNMENT

The chassis frame rails shall be cross checked to insure the length and to make sure each is square. The front and rear axles shall be laser aligned, additionally the tires and wheels shall be aligned and toe-in set on the front tires. The completed apparatus shall be rechecked for proper alignment once the chassis has been fully loaded.

REAR AXLE

The rear axle shall be a Meritor model number RT-44-145 tandem drive axle. The axle shall offer the widest range of ratios available, providing for compatibility with low RPM engines to ensure maximum fuel efficiency and performance. The axle shall feature a robust housing design with a standard 0.5 inch wall thickness, a shot-peened hypoid Generoid gearing with bolted ring gear to differential case attachment backed by a thrust screw. The axle shall feature precision forged differential gears, one-piece forward carrier design, large diameter input shaft and a rigid differential case.

The axle shall feature precision forged differential gears and shall have a rated capacity of 44,000 pounds.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE DIFFERENTIAL CONTROL

The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. The inter-axle differential lock shall be controlled by a locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the inter-axle differential control.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 68 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The tandem rear axle shall feature a Neway AD-248 air suspension. Each axle shall be independently suspended for optimum performance. The suspension shall include optimized air springs mounted to the equalizing beams and integral transverse beams. Adjustable torque rods and adjustable track bars shall also be included. The rear tandem suspension shall include 54.00 inch axle centers.

Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load.

The rear suspension is run flat compatible at reduced speeds.

The rear suspension capacity shall be rated at 40,000 to 44,000 pounds.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

FRONT TIRE

The front tires shall be Michelin 425/65R22.5 "L" tubeless radial XFE regional tread.

The front tire stamped load capacity shall be 22,800 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 120 pounds per square inch.

The front tire US Fire Service Intermittent Usage load capacity shall be 23,000 pounds per axle with a speed capacity of up to 75 miles per hour when properly inflated to 120 pounds per square inch.

REAR TIRE

The rear tires shall be Michelin 11R-22.5 16PR "H" tubeless radial XDN2 all weather tread designed for exceptional traction and mileage.

The rear tire stamped load capacity shall be 24,020 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 120 pounds per square inch.

The rear tire US Fire Service Intermittent Usage load capacity shall be 24,820 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 120 pounds per square inch.

TIRE PRESSURE EQUALIZATION SYSTEM

The rear dual tires shall include the Crossfire dual tire equalization system provided on both sets of dual tires on the rear axle. The Crossfire pressure system shall equalize and monitor the valve which is mounted between the dual tires. This shall bolt easily to the drive axle end allowing air to flow freely from one tire to the other, maintaining equal tire pressure and load distribution. The Crossfire system shall maximize tire life, decrease rolling resistance for increased fuel mileage and improve stability braking and overall safety.

TIRE PRESSURE INDICATOR

There shall be a pop up style tire pressure indicator at the front tire valve stem on the vehicle that shall indicate if there is insufficient pressure in the specific tire.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch aluminum wheels with the Alcoa XBR Dura-Bright® wheel treatment as an integral part of the wheel. Alcoa XBR Dura-Bright® wheels keep their shine without polishing; the wheels shall come clean simply by spraying with soap and water. Brake dust, grime and dulling oxidation shall wash off with no scrubbing and no special chemicals required.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with the Alcoa XBR Dura-Bright® wheel treatment as an integral part of the wheel. Alcoa XBR Dura-Bright® wheels keep their shine without polishing; the wheels shall come clean simply by spraying with soap and water. Brake dust, grime and dulling oxidation shall wash off with no scrubbing and no special chemicals required.

BALANCE WHEELS AND TIRES

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

WHEEL GUARDS

The rear dual wheels shall include a plastic isolator approximately 0.04" thick installed between the inner and outer wheel to help prevent corrosion caused by metal to metal contact.

TIRE CHAINS

Onspot brand six (6) strand automatic ice chains shall be installed on the rear axle of the chassis to provide instant traction while traveling on ice and snow at speeds below 35 mph.

TIRE CHAINS ACTIVATION

The tire chain system shall include a locking switch on the dash to deter accidental activation. The light on the switch shall illuminate when the tire chains are engaged. The tire chains shall be interlocked with the transmission and shall engage when the vehicle is traveling 30 MPH or less. After traveling over 30 MPH, the vehicle must be reduced to a speed below 5 MPH for the tire chains to be engaged or re-engaged.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a three (3) air tank, four (4) reservoir system with a total of 6220 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A six (6) sensor, six (6) modulator anti-lock braking system (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Automatic traction control which shall be installed on the tandem rear axle. The automatic traction control system shall apply the anti-lock braking system when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

Additional handling capabilities shall include roll stability control which shall monitor the vehicles rollover threshold based on the lateral acceleration. The system shall activate a computerized device which shall slow the vehicle when the threshold is exceeded in either direction. Normal vehicle operation shall resume once the problematic conditions cease. Roll stability control shall be integral with the ABS and ATC systems.

A virtual style switch shall be provided and properly labeled "mud/snow". When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

The electronic stability control unit (ESC) is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle's lateral acceleration. The CAN bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17" vented rotors.

REAR BRAKES

The rear brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted on the left hand dash to the right of the steering column within easy reach of the driver.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be located on the right frame rail behind the officer step.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with MGM type 24 long stroke brake chambers.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 24/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake pads against the brake rotor.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air cleaner bracket on the right frame rail behind the officer step.

MOISTURE EJECTORS

Heated, automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system.

AIR SUPPLY LINES

A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed on the chassis. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

AIR HORN SHUTOFF VALVE

A shut-off valve located in the driver's dash shall be installed in the air horn supply line.

WHEELBASE

The chassis wheelbase shall be 249.0 inches.

REAR OVERHANG

The chassis rear overhang shall be 112.00 inches.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

FRAME

The frame shall consist of double channel side rails and cross members forming a ladder style frame. The sides of the rails shall be constructed of "C" channel, 10.25 inches high X 3.5 inches deep X .38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and .38 inches thick, 110,000 psi minimum yield high strength low alloy steel. Each rail shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches calculated by the radius method. The frame shall measure 35.00 inches in width. Proposals calculating the frame strength using the "box method" shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the engine mounting, body mounting, pump mounting or bumpers shall not be considered as a cross member. The cross members shall be attached using grade 8 flanged head bolts and flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All holes for bolts shall be custom drilled into the frame rails, preventing fracture or fatigue. Each hole shall be placed relative to its component preventing unnecessary holes that present fatigue along each frame rail.

The frames proposed shall be custom drilled for each component and shall not include any unnecessary holes.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

The frame and cross members shall carry a lifetime warranty to the original purchaser.

FRAME CLEAR AREA

The chassis frame shall be left clear of chassis mounted components inside or outside the frame rails within the first 30.00 inches behind the cab to allow space for OEM installed components. Cross members may be installed in the clear area if required for proper frame or driveline configuration.

FRAME PAINT

The chassis under carriage consisting of frame, axles, driveline running gear, battery boxes, air tanks and other assorted chassis mounted components shall be painted the primary/lower cab color. Paint shall be applied prior to airline and electrical wiring installation.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed of ASTM A-36 steel; the bumper shall then be painted. The bumper shall include a .38 thick structural steel channel which shall measure 12.00 inches high and 101.00 inch wide, with angled front corners.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended 31.00 inches ahead of the cab.

FRONT BUMPER EXTENSION WIDTH

The front bumper extension splayed frame rails shall include an overall width of 44.75 inches.

FRONT BUMPER PAINT

The front bumper shall include a finish topcoat painted the same as the lower cab color.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123.00 decibels of sound at 10.00 feet. The siren shall produce a long distance warning siren which shall include a unique heavy duty caster clutch design which provides a longer coast down sound while reducing the amp draw requirements to (100) amps. The Federal Q2B™ siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep.

MECHANICAL SIREN LOCATION

The siren shall be recess mounted in the center on the front fascia of the bumper between the frame rails.

AIR HORN

The front bumper shall include two (2) Hadley brand E-Tone air horns which shall measure 24.00 inches long with a 6.00 inch round flare. The air horn shall be a trumpet style and shall include a chrome finish on the inside and a black painted finish on the outside of the trumpet.

AIR HORN LOCATION

The two (2) air horns shall be shipped loose for the body manufacturer to install in the bumper. The body manufacturer shall cut all holes required in the bumper for the horn installation.

AIR HORN RESERVOIR

One (1) air tank, with a 1200 cubic inch reservoir, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

The bumper shall include two (2) Cast Products Inc. model SA4301, 100 watt speaker which shall be recess mounted within the bumper fascia. The speaker shall include a flat mounting flange and be chrome in color.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ELECTRONIC SIREN SPEAKER LOCATION

The speakers shall be located one (1) on the driver's side and one (1) on the officer's side of the bumper fascia, outboard of the frame rails.

FRONT BUMPER TOW EYES

The bumper shall include two (2) chrome plated tow eyes which shall be installed below the front bumper. The tow eyes shall be fabricated from 0.75 inch thick 1020 ASTM-A36 hot rolled steel. The inside diameter of the eye shall be 2.00 inches and include a chamfered edge.

CAB TILT SYSTEM

The entire cab shall be capable of tilting 45 degrees to allow for easy maintenance of the engine and transmission.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the "Down" button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90" ball and be anchored to frame brackets with 1.25" diameter studs.

A steel safety channel assembly shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT AUXILIARY PUMP

A manual cab tilt pump module shall be attached to the rear surface of the driver side battery box.

CAB TILT LIMIT SWITCH

A cab limit switch shall be installed. The switch will effectively limit cab's travel when being tilted. The final adjustment of the switch shall be performed by the apparatus manufacturer to prevent damage to the cab and any bumper mounted option mounted in the cab tilt arc.

CAB TILT CONTROL RECEPTACLE

The cab tilt shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a 6-pin Deutsch connector that includes a cap. The remote control pendant shall also include 20.00 feet of cable which also includes a mating connector.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CAB WINDSHIELD

The cab windshield shall have a surface area of 2884.00 square inches and be of a two (2) piece wraparound design for maximum visibility.

The distance from the driver and officer to the windshield shall be a minimum of 42.00 inches at the furthest seated position. This distance shall ensure the safety of the driver and officer from intruding objects in the unlikely event of a head on collision.

The glass utilized for the windshield a standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and maintenance costs. All proposals offering windshields not in compliance with the minimum measurement of surface area stated above and are not fully interchangeable shall not be considered.

GLASS FRONT DOOR

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished via electric actuation. The power windows shall be controlled via switching on the driver door and by a switch on each respective door.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR RH

The rear right hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's door panel.

GLASS TINT REAR DOOR RH

The window located in the right hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR LH

The rear left hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's door panel.

GLASS TINT REAR DOOR LH

The window located in the left hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

GLASS SIDE MID RH

The cab shall include a window on the officer's side behind the front and ahead of the crew doors which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID RH

The window located on the right hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS SIDE MID LH

The cab shall include a window on the driver's side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID LH

The window located on the left hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS UPPER SIDE FRONT

The triangular shaped 14.00 inch wide X 14.00 inch high windows shall be omitted from the left and right sides of the raised roof.

GLASS UPPER SIDE MID

The middle section of the raised roof on the left and right sides of the cab shall include a window which shall measure 16.00 inches wide X 14.00 inches high. These windows shall be fixed within this space. These windows shall be mounted using black self-locking window rubber.

GLASS TINT UPPER SIDE MID

The windows located in the upper section on each side in the middle of the cab shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS UPPER SIDE REAR DOOR

Windows shall be provided in the upper portion of each rear door of the raised roof cab. Each window shall measure 27.00 inches wide X 14.00 inches high and be installed above the lower door window. The windows shall be rectangular in shape and fixed within this space. The windows shall be mounted using black self-locking window rubber.

GLASS TINT UPPER SIDE REAR DOOR

The window located in the upper section of the rear crew doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CLIMATE CONTROL

The cab shall be equipped with a ceiling mounted combination defrost / heating and air-conditioning system mounted above the engine tunnel in a central location.

The system shall offer sixteen (16) adjustable louvers. Six (6) of the louvers shall face forward towards the windshield, offering 45,000 BTU of heat at 320 CFM for defrosting. The system shall include six (6) rearward facing louvers to direct air for the crew area and four (4) for driver and officer comfort. When in "Cabin Mode" the system shall be designed to produce 60,000 BTU of heat and 32,000 BTU of cooling. The HVAC cover shall be made of ABS plastic.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab.

The air conditioning system shall be capable of lowering the cab interior temperature from 100 degrees to 70 degrees within thirty minutes, with a relative humidity of sixty percent.

The air conditioner lines shall be a mixture of custom bent zinc coated steel fittings and Aero-quip GH 134 flexible hose with Aero-Quip EZ-Clip fittings.

CLIMATE CONTROL ACTIVATION

The heating controls, and air conditioning if included, shall be located on the Vista screen.

HEATER HOSE INSULATION

The heater hoses leading from the engine to the cab shall include a foam insulation wrap which runs the length of the hose improving heating in extreme cold climates. The heating hoses which shall be routed inside the cab shall not be insulated.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed centered on cab forward of raised roof against the slope rise.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

CAB CIRCULATION FANS FRONT

The cab shall include two (2) all metal construction 6.00 inch windshield defogger fans which shall be installed in the front cab corners. The fans shall be individually controlled via a virtual button on the Vista.

CAB INSULATION

The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall include a foil facing which includes grid reinforcement. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

UNDER CAB INSULATION

The underside of the cab tunnel surrounding the engine shall be lined with foam insulation, engineered for application inside diesel engine compartments.

The foam insulation shall measure .56 inch thick including a 1.0#/sf PVC barrier and a moisture and heat reflective foil backing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. And as an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads.

The foam shall meet or exceed MVSS 302 flammability test.

The foam shall be cut precisely to fit each section and sealed for additional heat and sound deflection.

INTERIOR TRIM FLOOR MAT

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch sound absorbing closed cell foam and a 0.06 inch non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive with aluminum corner trim. All exposed seams shall be sealed with a silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM VINYL

The cab interior shall include trim on the front and rear crew ceiling, the cab walls and the rear wall of the cab. The trim shall be constructed of insulated vinyl over a hard board backing. The trim shall be securely fastened to the interior of the cab utilizing snap style fasteners with a decorative cover for a more appealing appearance.

HEADER TRIM

The cab interior shall include a header over the driver and officer dash which shall be vacuum formed ABS composite panel with robust styling grooves providing structural integrity. The header shall include (2) vents within the header which are directed at the windshield. Also included will be a drop down panel for access behind the header for service of electronic components, if necessary. The header shall include (2) cut outs, (1) over the driver and (1) over the officer to accommodate speakers and molded areas to accommodate the sun visors.

INTERIOR TRIM SUNVISOR

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

TRIM LH DASH

The left hand dash shall be a one (1) piece durable vacuum formed ABS composite housing which shall be custom molded for a perfect fit around the instrument panel and the lower control panels to the left and right of the steering column.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

TRIM CENTER DASH

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick, one hundred percent primary aluminum plate.

TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick, one hundred percent primary aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.63 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment, recessed 3.00 inches below the surface of the dash and measure 16.00 inches wide X 14.00 inches deep.

TRIM RH DASH ACCESSORIES

The MDT slide-out tray shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick, one hundred percent primary aluminum plate. The tray shall be mounted in the area specifically provided on the right hand dash. The mounting surface of the tray measures 12.50 inches wide X 10.75 inches deep which shall allow for the mounting of a MDT with the added luxury of sliding it toward the officer as much as 11.00 inches.

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with .44 of an inch thick multi-layer mat consisting of .25 inch closed cell foam, .13 of an inch thick rubber and .06 inch thick non-slip pebble grain.

POWER POINT DASH MOUNT

The cab interior shall include three (3) 12 volt cigarette lighter type receptacles in the cab dash as a power source for additional portable or mobile items. The receptacles shall be wired battery direct.

STEP TRIM

The cab steps shall include a 14 gauge 304 perforated stainless steel construction on the first step, the step closest to the ground. The stainless steel finish shall be a number 7 mirror. The step shall include a frame which is integral with the construction of the cab for rigidity and strength. The perforation shall allow water and other debris to flow through rather than becoming packed under the step. The middle step shall be integral with the cab in construction and shall be trimmed in 3003-H22 embossed aluminum tread plate which is 0.084 inches thick.

INTERIOR DOOR TRIM

The doors of the cab shall include an aluminum plate the same weight and grade as the cab on the interior of the door. The aluminum shall be then painted.

DOOR TRIM SCUFF PLATE

The trim along the door shall include a stainless steel plate along the door jam to prevent the chipping of paint should the seat belt buckle come in contact with the door jam.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CAB DOOR TRIM REFLECTIVE

A stripe of WHITE reflective tape shall be installed at the outer edge of each door.

INTERIOR GRAB HANDLE "A" PILLAR

A rubber covered 11.00 inch grab handle shall be provided on the inside of the cab on the hinge post at the driver and officer doors. The handle shall assist personnel in exiting and entering the cab.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish and provide ease of access and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door the full width of the door below the window glass and shall measure 30 inches in length. The handle shall assist personnel in exiting and entering the cab.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be gray in color.

INTERIOR TRIM VINYL COLOR

The cab interior vinyl trim surfaces shall be gray in color.

INTERIOR ABS TRIM COLOR

The cab interior vacuum formed ABS composite trim surfaces shall be gray in color.

CAB PAINT INTERIOR

The interior metal surfaces shall be painted with a Zolatone #20-72 silver gray texture finish.

CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted with a Zolatone #20-72 silver gray texture finish.

DASH PANEL GROUP

The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SWITCHES CENTER PANEL

The center dash panel shall include six (6) switch positions in the upper left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have red backlighting provided.

SWITCHES LEFT PANEL

The left dash panel shall include one (1) wiper switch which shall be located in the left hand side of the panel. All switch legends shall have red backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall include no rocker switches or legends.

SWITCH PANEL IGNITION

The vehicle shall be equipped with a keyless ignition and master, with an "Off/ On" and a two switch for "Off/ Start".

SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the chassis. The system shall provide visual and audible warning when any seat is occupied (sixty pounds minimum), the corresponding seat belt remains unfastened, and the park brake is released.

Once activated, the visual and audible indicators shall remain active until all occupied seats have the seat belts fastened. The dash shall include a display on the Weldon Vista screen(s) indicating the occupancy of each seat.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

OCCUPANCY ROLLOVER PROTECTION

The vehicle shall include the Spartan Chassis RollTek™ rollover occupant protection system which shall secure occupants, increase the survivable space within the cab and protect against head/neck injuries in the event of a roll over accident.

The system shall function using a microprocessor-controlled, solid-state sensing device which, when the system detects a side roll shall provide instantaneous occupant protection (less than 0.3 seconds from trigger to total deployment) by automatically initiating the following sequence:

1. The seat belt shall tighten around the occupant on all seats excluding theatre flip-up style seating.
2. The air suspension on each seat shall be reduced to its lowest position, tightens belt around occupant and locking the seat in this position thereby providing more survivable space and minimizing head contact with the interior roof (available when air suspension seats are specified).
3. An inflatable curtain shall deploy which includes an air filled bag across the driver's and passenger's side windows which shall protect and cushion the head and neck of the occupant thereby reducing movement and the chance of head contact with the side of the vehicle. The inflatable curtain shall be applicable on all seats adjacent to the cab side excluding theatre flip-up style seating.

System Components Shall Include:

Integrated Roll Sensor **IRS** - detects an imminent rollover, activates protective devices and records crash events.

Integrated Belt Pretension **IBP** device (not available with air suspension seats) - tightens the seat belt around occupant, securing occupant in seat and positions occupant for contact with integrated head cushion.

Seat Pull-down System **S4S** (air suspension seats only) - locks seat to lowest position, increases survivable space, tightens belt around occupant, secures occupant in seat and positions occupant for contact with integrated head cushion.

Inflatable Head Cushion **IHC** - protects head/neck and shields occupant from dangerous surfaces. Remains inflated for 8-10 seconds. This device shall affect the driver, officer and adjacent seats to cab side excluding theatre flip-up style seating.

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

All seats supplied on the chassis shall be gray in color. This material shall be semi-resistant to UV rays and from being saturated or contaminated by fluids.

SEAT BACK LOGO

The seat backs shall include the logo for SVI. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a red, three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

OCCUPANCY ROLLOVER PROTECTION DRIVER

The driver's position shall be equipped with the RollTek® Rollover Occupant Protection System.

SEAT OFFICER

The officer's seat shall be an H.O. Bostrom Firefighter model seat. The seat shall feature two-way manual adjustment and shall include a tapered and padded seat cushion. The seat shall also feature integral springs to isolate shock.

There shall be a red, three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The seat belt assembly anchorages shall conform to the Federal Safety Standard (FMVSS) No. 210, "Seat belt assembly anchorages".

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207, 209, 210 and 302 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SEAT BACK OFFICER

The officer's seat shall feature a SecureAll™ SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable with all adjustment points using similar hardware and adjustments with one tool.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the taken in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

OCCUPANCY ROLLOVER PROTECTION OFFICER

The officer's position shall be equipped with the RollTek® Rollover Occupant Protection System.

POWER SEAT WIRING

The power seat or seats installed in the cab shall be wired directly to battery power.

SEAT REAR FACING OUTER LOCATION

The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the driver seat and one (1) located directly behind the officer seat.

SEAT CREW REAR FACING OUTER

The crew area shall include a seat in the rear facing outboard position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a red, three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SEAT BACK REAR FACING OUTER

The rear facing outboard seat shall feature a Bostrom SecureAll™ SCBA locking system which shall store all U.S. and International SCBA brands and bottle sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable at all adjustment points with one tool.

The bracket system shall be free of straps, that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA bottle in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the center of the bottom seat cushion for easy access and to eliminate hooking the release handle with clothing or other equipment.

SEAT MOUNTING REAR FACING OUTER

The rear facing outer seat shall be mounted facing the rear of the cab.

OCCUPANCY ROLLOVER PROTECTION RFO

The rear facing outboard seating position shall be equipped with the RollTek® Rollover Occupant Protection System.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

SEAT FORWARD FACING CENTER LOCATION

The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall.

SEAT CREW FORWARD FACING CENTER

The crew area shall include a seat in the forward facing center position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a red, three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SEAT BACK FORWARD FACING CENTER

The forward facing center seat shall feature a SecureAll™ SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable with all adjustment points using similar hardware and adjustments with one tool.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the taken in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

SEAT MOUNTING FORWARD FACING CENTER

The forward facing center seats shall be installed facing the front of the cab.

OCCUPANCY ROLLOVER PROTECTION FFC

The forward facing center seating position shall be equipped with the RollTek® Rollover Occupant Protection System.

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include an enclosed seat frame which is located and installed on the rear wall. There shall be two (2) access points to this storage area through the front of the seat frame. These accesses shall include hinged doors measuring 13.75 inches wide X 10.00 inches high. Each door shall include a flush style latch. The seat frame shall measure 47.50 inches wide X 12.38 inches high X 22.00 inches deep and shall be fully open offering storage within this area. The seat frame shall be constructed of 5052-H32 Marine Grade, .190 inch thick, 100 percent primary smooth aluminum plate. The seat box shall be painted with the same color as the remaining interior.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the seat frame storage area which shall be located in the center on the front of the seat frame. Each access point shall be covered by a hinged door with a non-locking latch. The surface of the access doors and the forward facing panel of the seat frame facing the interior of the cab shall be coated with the same material as the interior metal surfaces of the cab.

CAB FRONT UNDERSEAT STORAGE ACCESS DOOR

The left and right front under seat storage areas shall each have a removable solid aluminum panel. The panels shall be painted to match the interior metals surfaces of the cab.

WINDSHIELD WIPER SYSTEM

The cab shall include a parallel arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a rod style arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the speedometer shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be aluminum with a polished chrome plated finish. The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel. All doors shall be keyed alike and designed to prevent accidental lockout.

The interior latches shall be black flush paddle type, which are incorporated into an upper door panel.

DOOR LOCKS

The entry doors shall include an independent manual door lock actuated through a toggle switch located on the interior of the cab door near the paddle handle or by using a Trimark key through the exterior of the door.

DOOR LOCK LH REAR CAB COMPARTMENT

The driver side rear compartment shall feature a manual door lock.

DOOR LOCK RH REAR CAB COMPARTMENT

The officer side rear compartment shall feature a manual door lock.

GRAB HANDLES

The cab shall include one (1) 18.00 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The assist handle shall be made of 14 gauge 304- stainless steel and be 1.25 inch diameter to enable easy grabbing with the gloved hand. Each assist handle shall include a stainless steel plate behind which saves the cab from scuffs through continued use of the handle.

REARVIEW MIRRORS

Ramco model CRM-310-1750-TPCHR bus style mirrors shall be provided. The mirror heads shall be injection molded chrome plated ABS plastic and shall measure 9.50 inches wide X 17.50 inches high. The mirrors shall be mounted one (1) on each the driver and officer doors of the cab with polished die-cast aluminum arms.

The mirrors shall feature an upper heated remote controlled convex glass with a lower heated remote controlled flat glass. The mirror control switches shall be located within easy reach of the driver. The mirrors shall be manufactured using the finest quality non-glare glass and shall feature a rigid mounting thereby reducing vibration. The mirrors shall be corrosion free under all weather conditions.

REARVIEW MIRROR HEAT SWITCH

The heated rearview mirrors shall be controlled through a virtual button on the multiplex display.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. The two-piece liners shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of 14 gauge 304 polished stainless steel.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them.

CAB EXTERIOR MODEL NAMEPLATE

The cab shall not include any custom model nameplates relative to any specific model.

IGNITION

The master starting system, ignition system shall include chrome thumb turn switch which shall be mounted on the driver side of the cab to the left of the steering wheel on the dash. Each switch will be accompanied by (1) green LED indication light which shall light when the ignition is in the "ON" position and (1) for the master battery switch when in the "ON" position. The thumb turn switches shall also be accompanied by a chrome push button which shall only operate when both the master battery and ignition thumb switches are in the "ON" position.

BATTERY

The single start electrical system shall include (6) Harris BCI 31 950 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541. The cables shall have encapsulated ends with heat shrink and sealant.

BATTERY TRAY

The batteries shall be installed within two (2) steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed and encapsulated at the ends with heat shrink and sealant.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR

The starting system shall include a 320 amp Leece-Neville 12 volt alternator. The alternator shall include a self-exciting integral regulator.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

BATTERY CONDITIONER

A Kussmaul 1200 battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab behind the driver's seat.

BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in the cab, viewable through the cab mid side window behind the driver's door.

AUXILIARY AIR COMPRESSOR

A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be installed behind the officer's seat. The air compressor shall be plumbed to the air brake system to maintain air pressure.

ELECTRICAL INLET

A Kussmaul 30 amp super auto-eject electrical receptacle shall be connected to the battery conditioner and installed on the driver's side of the cab above the wheel well. It shall automatically eject the plug when the starter button is depressed.

The U.L. maximum allowable amperage draw on receptacles is generally 80% of their listed rating, for example, the 30 amp receptacle should not carry more than 24 amp continuous load. When adding the different amperage draws of the components being installed on the chassis be sure to factor in whether the components will draw a continuous load or intermittent load.

Amp Draw Reference List:

Kussmaul 1000 Charger - 3.5 Amps
Kussmaul 1200 Charger - 10 Amps
Kussmaul 35/10 Charger - 10 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps

ELECTRICAL INLET COLOR

The Kussmaul Auto- Eject electrical inlet connection shall include a red cover.

HEADLIGHTS

A hinged headlamp and combination side marker/turn lamp module shall be part of the front cab fascia. This combination shall include (2) rectangular halogen High/Low beam headlamps with integrated side marker/turn signal lamps. The headlamps shall be equipped with a "Daytime Running" light feature, which will illuminate the headlights to 80% brilliance when the ignition switch is in the "On" position and the parking brake is released.

The headlights shall be controlled via a virtual button on the Vista display.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable LED amber turn signals which shall be installed above and outboard of the front warning and head lamps. The turn signals shall be mounted in a polished aluminum housing.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly above the front warning lights.

SIDE TURN/MARKER LIGHTS

The headlight module shall include two (2) side turn and marker lights which shall be integral with the headlights.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) cab LED marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

CORNERING LIGHTS

The bumper tail shall include two (2) Whelen model 500 Super LED steady-on cornering lamps with clear lenses in the upper position, one (1) each side.

GROUND LIGHTS

Each door shall include LED NFPA compliant light heads mounted to the under side of the cab. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated through the Vista screen and by the opening of either door on the respective side of the cab.

STEP LIGHTS

The middle step located at each door shall include a recess mounted LED light which shall activate with the opening of the respective door.

ENGINE COMPARTMENT LIGHT

There shall be an incandescent NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

FRONT SCENE LIGHTS

The front of the cab shall include two (2) Fire Research Optimum model OPA800-H15 contour roof mount lights installed on the brow of the cab.

Each lamp head shall have one (1) High Intensity Discharge (HID) 150 watt 12 volt bulb. Each bulb shall draw 12.5 amps and generate 11,250 lumens. Each lamp head shall produce a uniform beam that lights up an area 100-degrees vertically by 150-degrees horizontally. Each lamp head shall be no more than 6.44 inches in height X 8.69 inches in width. The lamp heads and brackets shall be powder coated white.

FRONT SCENE LIGHTS ACTIVATION

The front scene lights shall be activated by a virtual button on the MUX display.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

FRONT SCENE LIGHT LOCATION

There shall be two (2) scene lights mounted to the front brow of the cab in the outboard position centered over the outer front marker lights.

RECESSED SIDE SCENE LIGHT MODEL

Installed on the sides of the cab shall be two (2) Fire Research Focus model FCA200-D15 recessed lights, one (1) per side. The housing shall incorporate internal heat-dissipating fins and have cutout dimensions not to exceed 2" deep by 4 1/4" high by 9 3/4" wide. The lamphead shall protrude no more than 1 1/2" from the housing flange. Wiring shall extend from the bottom of the housing.

The lampheads shall have one (1) quartz halogen 150 watt 12 volt bulb. The bulb will draw 12.5 amps and generate 2600 lumens. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The bulb shall be accessible through the front. Lamphead and housing shall be powder coated white. The floodlight shall be UL listed as a scene light for fire service use.

SIDE SCENE LIGHT LOCATION

The scene lights located on the left and right sides of the cab shall be mounted in the upper front raised roof portion of the cab above the front doors.

SIDE SCENE ACTIVATION

The scene lighting shall be activated via two (2) virtual buttons on the MUX display located inside the cab.

INTERIOR OVERHEAD LIGHTING

The cab shall include a two-section incandescent dome lamp with a red and white lens located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 9.50 inches in length X 5.00 inches in width with a black colored bezel. The white portion of each lamp shall be activated by opening the respective door and via the multiplex display and both the red and white portion can be activated by individual switches on each lamp.

An additional two-section incandescent red and white lamp shall be provided over the engine tunnel which can be activated by individual switches on the lamp.

AUXILIARY DOME LIGHT FRONT CREW

The cab headliner above the rear facing crew seats shall include a total of four (4) 7.00 inch dome lamps, with one (1) clear and (1) red centered over both of the outboard and center rear facing seating positions. These lamps shall be activated by the rear doors as well as an individual switch located on the side of each lamp; also the red to be activated via individual toggle switch on the sill area of each mid side window.

AUXILIARY DOME LIGHT REAR CREW

The cab headliner above the forward facing crew seats shall include a total of four (4) 7.00 inch dome lamps, with one (1) clear and (1) red centered above the two (2) center forward facing seating positions. The clear lamps shall be activated by the rear doors as well as an individual switch located on the side of the lamp. The red lamps will be activated by an individual toggle switch on the sill area of each rear side window, as well as by an individual switch located on the side of each lamp.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

MAP LIGHTS

One (1) each Sunnex brand gooseneck style instrument panel map light with a switch at the base shall be mounted to the air conditioning cover on the officer's side.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a red flashing light, located in the center for greatest visibility. The light shall be 6.00 inches long X 2.50 inches wide X 1.75 inches high and shall be clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound when a door is open and the parking brake is released.

The light and alarm shall be interlocked for activation when a cab door is not firmly closed, an apparatus cabinet door is not closed and the parking brake is released.

MASTER WARNING SWITCH

The optical warning system shall be controlled by a master switch which shall include all "ON" and all "OFF" capability via a virtual button within the MUX display. All warning lights which are "ON" when the master switch is activated shall also activate. This switch shall be clearly labeled for identification.

HEADLIGHT FLASHER

An alternating high beam headlamp flashing system shall be installed into the high beam headlamp circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.

ALTERNATING HEADLIGHT SWITCH

The flashing headlights shall be activated through a virtual button on the MUX display.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include dual Whelen series 600 Super LED warning lights which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be surface mounted to the front fascia of the cab within a chrome bezel in the inboard position.

INBOARD FRONT WARNING LIGHTS COLOR

The front warning lights mounted on the fascia for the inboard position shall be red with a clear lens.

FRONT WARNING SWITCH

The front warning lights shall be controlled through a virtual control on the MUX display. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen series 600 Super LED intersection warning lights, one (1) each side, which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

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INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red with a clear lens.

INTERSECTION WARNING LIGHTS LOCATION

The intersection lights shall be mounted in the rear position on the side of the bumper.

SIDE WARNING LIGHTS

The cab sides shall include a Whelen series 600 Super LED 4"x6" warning light, one (1) each side, which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the chassis shall be red with clear lens.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through a virtual control on the MUX display. This switch shall be clearly labeled for identification.

INTERIOR DOOR WARNING LIGHTS

The interior panels of each door shall include one (1) red 4.00 inch diameter LED Truck-Lite warning light which shall be provided on the inner surface of each cab door. Each light shall activate with a flashing pattern when the door is in the open position to serve as an indicator to oncoming traffic.

SIREN CONTROL HEAD

A Whelen 295HFS2 200 watt "hands free" remote siren amplifier control head shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature hands free mode and will be in "standby" mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

HORN RING SELECTOR SWITCH

A virtual button on the MUX display shall allow control to either the air horn or the electric horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position which is in accordance with FMVSS requirements.

AIR HORN ACTIVATION

The air horn actuation shall be accomplished by the steering wheel horn button and a driver and officer's mounted Linemaster model SP491-S81 foot switch. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

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MECHANICAL SIREN ACTIVATION

The mechanical siren shall be actuated by a driver and officer mounted Linemaster model SP491-S81 foot switch and shall include a siren brake switch on the multiplex display and a push button on the dash. The siren shall only be active when master warning switch is on.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of not less than 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. The gauges shall be backlit with red LED lamps. All gauges shall be driven by stepper motor movements. The instrumentation system shall be multiplexed and shall receive engine and transmission information over the J1939 data bus to reduce redundant sensors.

The instrument panel shall contain the following gauges:

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) electronic speedometer with an integral LCD odometer/ trip odometer and hour meter shall be included. The speedometer shall have a dual scale with miles per hour (MPH) as the dominant scale and kilometers per hour (KPH) on the minor scale. The speedometer scale shall read from 0 to 90 MPH (0 to 140 KPH). The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display up to 9,999.9 miles. The LCD screen shall also be capable of displaying certain diagnostic functions. The hour meter shall display engine hours of operation.

One (1) three function gauge with primary system, secondary system and fuel level shall be included. The scale on the air pressure gauges shall read from 0 to 140 pounds per square inch (PSI). The air pressure scales shall be non-linear to expand the scales in the region of normal operation. A red indicator light in the gauge shall indicate a low air pressure. The scale on the fuel level gauge shall read from empty to full. A yellow indicator light shall indicate low fuel at the quarter tank level.

One (1) four function gauge with engine oil pressure, coolant temperature, transmission oil temperature and a voltmeter shall be included. The scale on the engine oil pressure gauge shall read from 0 to 140 pounds per square inch (PSI). The engine oil pressure scale shall be non-linear to expand the scale in the region of normal operation. A red indicator light in the gauge shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 160 to 250 degrees Fahrenheit (F). A red indicator light in the gauge shall indicate high coolant temperature. The scale on the transmission oil temperature gauge shall read from 100 to 300 degrees Fahrenheit (F). A red indicator light in the gauge shall indicate high transmission oil temperature. The scale on the voltmeter shall read from 8 to 16 volts. A red indicator light shall indicate high or low system voltage.

The instrument panel shall contain an Annunciator Module that contains the following indicator lights. All indicator lights shall contain LED lamps.

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RED LAMPS

Stop Engine - indicates critical engine fault. (5)
Park Brake - indicates park brake is set.
Volts - indicates high or low system voltage. (4)
Low Oil Press - indicates low engine oil pressure. (4)
High Coolant Temp - indicates excessive engine coolant temperature. (4)
High Trans Temp - indicates excessive transmission oil temperature. (4)
Low Air - indicates low air pressure in either system one or system two. (4)
Low Coolant Level - indicates low engine coolant level. (1) (5)
Air Filter - indicates excessive engine air intake restriction. (5)
Brake System Fault – indicates a failure in the brake system (hydraulic brake systems only). (5)
Seat Belt Indicator – indicates when a seat is occupied and corresponding seat belt remains unfastened.

YELLOW LAMPS

Check Engine - indicates engine fault. (5)
Check Trans - indicates transmission fault. (5)
Wait to Start - indicates active engine air preheat cycle. (2) (5)
ABS - indicates anti-lock brake system fault. (5)
Water in Fuel - indicates presence of water in fuel filter. (1) (5)
Check Message Center – indicates there is a fault message present in the LCD digital display.
SRS – indicates a problem in the RollTek supplemental restraint system. (1) (5)
DPF – indicates a restriction of the diesel particulate filter. (3) (5)
HEST – indicates a high exhaust system temperature. (3) (5)
MIL – indicates an engine emission control system fault. (3) (5)
Low Fuel – indicates low fuel. (4)

GREEN LAMPS

Left and Right turn signal indicators.
Aux Brake Active - indicates secondary braking device is active. (1)
High Idle - indicates engine high idle is active. (1)
ATC – indicates low wheel traction for automatic tractions control equipped vehicles, also indicates mud/snow mode is active for ATC system. (1) (5)
OK to Pump – indicates the pump engage conditions have been met. (1)
Pump Engaged – indicates the pump is currently in use. (1)

BLUE LAMPS

High beam indicator.

The instrumentation system shall provide a constant audible alarm for the following situations:

Low air pressure.
Low engine oil pressure.
High engine coolant temperature.
High transmission oil temperature.
Low coolant level. (1)
High or low system voltage
Critical engine fault (Stop Engine).

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The Check Message Center icon will illuminate and a message will be displayed in the LCD screen for the following situations:

- Cab Ajar
- Low Oil Level
- Door Ajar
- Engine Communication Error
- Transmission Communication Error
- ABS Communication Error
- High Coolant Temp
- Turn Signal Reminder (turn signal left on for more than one (1) mile)
- Low Fuel
- Low Oil Pressure
- Low Coolant Level
- Low Battery Voltage
- High Battery Voltage
- Low Primary Air Pressure
- Low Secondary Air Pressure
- High Trans Temp

The instrumentation system will provide a continuous alarm for the following situations:

- Stop Engine
- Low Coolant Level (1)
- Brake System Fault
- Check Trans
- Check Engine
- ABS
- Engine Communications Error
- Transmission Communications Error
- ABS Communications Error
- Low Fuel
- Low Primary Air Pressure
- Low Secondary Air Pressure
- Low or High Battery Voltage
- High Trans Temp
- Low Oil Pressure
- High Coolant Temp

The instrumentation system will provide a 160 millisecond second alarm every 880 milliseconds for the following situations:

- Seat Belt
- Air Filter
- Water in Fuel (1)
- Cab Ajar
- Low Oil Level
- Door Ajar

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The instrumentation system will provide a 160 millisecond second alarm every 5 seconds for the following situation:
Turn Signal Reminder (turn signal left on for more than one (1) mile)

- (1) Feature only available when optionally equipped.*
- (2) Feature only available on engines with pre-heat capability.*
- (3) Feature only on vehicles with diesel particulate filter (DPF).*
- (4) Warning light is present in gauge.*
- (5) A message in the LCD screen will also be displayed.*

AUXILIARY SPEEDOMETER

The overhead area forward of the officer shall include a speedometer which shall feature a digital readout. The speedometer shall be located inboard towards the center of the cab in the officers area.

RADIO

A Panasonic compact disc player with AM/FM stereo receiver, weather band and four (4) speakers shall be installed in the cab. The receiver shall be installed above the driver position. The speakers shall also be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers in the upper rear corners of the cab. The CD receiver shall cut-out with the activation of the master warning light switch.

RADIO ANTENNA

A small antenna shall be located on the driver side of the cab roof for AM/FM and weather band reception.

CAMERA

An Audiovox Voyager heavy duty rearview camera system shall be supplied. One (1) camera with a teardrop shaped chrome plated housing shall be shipped loose for OEM installation in the body to afford the driver a clear view of the rear of the vehicle. The camera shall be wired to dual Weldon Vista displays located, one (1) on the driver and one (1) on the officer dash. The camera shall activate when the transmission is placed in reverse and by a button on the Vista displays.

CAB EXTERIOR PROTECTION

The cab face and rear wall shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

ROAD SAFETY KIT

The cab and chassis shall include one (1) emergency road side triangle kit.

DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) complete sets of wiring schematics and option wiring diagrams.

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BUILD SPECIFICATION

WARRANTY - CAB AND CHASSIS

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twelve (12) months, or the first 24,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the end user. The warranty shall include conditional items listed in the detailed warranty document which shall be provided upon request.

OPERATORS AND PARTS LIST MANUAL

There shall be two (2) chassis operator's manual which includes a parts list. Also, wiring and air plumbing diagrams shall be provided as well as a list of any parts or equipment that is shipped loose with the vehicle. All standard wiring and plumbing diagrams shall be created specifically to the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS

There shall be two (2) sets of engine operation and maintenance manuals and two (2) sets of transmission operation manuals specific to the models ordered included with the final vehicle in the ship loose items.

ENGINE SERVICE MANUALS

There shall be two (2) sets of the following Cummins ISM engine service reference manuals which shall be provided with the final vehicle.

Engine Troubleshooting and Repair Manual, part number 3666322
Fuel System Troubleshooting and Repair Manual, part number 4021461
Shop Manual M11 Series Engine, part number 3666075
Wiring Diagram, part number 3666269
Parts Catalog, part number 4056523
Operation and Maintenance Manual, part number 4021342

TRANSMISSION SERVICE MANUALS

There shall be two (2) sets of the following manuals included with the chassis relative to the Allison 4000 transmission:

Allison Parts Catalog, part number PC2809EN
Allison Service Manual, part number SM2457EN
Allison Technician Manual, part number GN2055EN
Electronic Controls Troubleshooting Manual, part number TS2973EN
Mechanic's Tips, part number MT3004EN

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BUILD SPECIFICATION

CHASSIS MODIFICATIONS

LUBRICATION AND TIRE DATA PLATE

A permanent label in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle and tire information:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid . . (if applicable)
- Pump priming system fluid, if applicable . . (if applicable)
- Drive axle(s) lubrication fluid
- Air conditioning refrigerant . . (if applicable)
- Air conditioning lubrication oil . . (if applicable)
- Power steering fluid
- Cab tilt mechanism fluid . . (if applicable)
- Transfer case fluid . . (if applicable)
- Equipment rack fluid (if applicable)
- CAFS air compressor system lubricant . . (if applicable)
- Generator system lubricant . . (if applicable)
- Front tire cold pressure
- Rear tire cold pressure
- Maximum tire speed ratings

VEHICLE DATA PLATE

A permanent label in the driving compartment which indicates the following:

- Filter part numbers for the
 - Engine
 - Transmission
 - Air
 - Fuel
- Serial numbers for the
 - Engine
 - Transmission
- Delivered Weights of the Front and Rear Axles
- Paint Brand and Code(s)
- Sales Order Number

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BUILD SPECIFICATION

OVERALL HEIGHT, LENGTH DATA PLATE

The fire apparatus manufacturer shall permanently affix a high-visibility label in a location visible to the driver while seated.

The label shall show the height of the completed fire apparatus in feet and inches or in meters, the length of the completed fire apparatus in feet and inches or in meters, and the GVWR in tons or metric tons.

Wording on the label shall indicate that the information shown was current when the apparatus was manufactured and that, if the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate.

ACCIDENT PREVENTION

There shall be a placard in the cab seating area which reads, "ALL OCCUPANTS MUST BE SEATED AND BELTED WHEN THE APPARATUS IS IN MOTION".

PERSONNEL CAPACITY

A label that states the number of personnel the vehicle is designed to carry shall be located in an area visible to the driver.

ACCIDENT PREVENTION

If the rear bumper is 8" deep or more, there shall be a placard on the rear face of the body, in clear sight from the ground, which reads, "WARNING - DO NOT RIDE ON STEPS OR DECK AREAS WHILE THE APPARATUS IS IN MOTION. DEATH OR SERIOUS INJURY MAY RESULT".

WEARING HELMET WARNING

A label stating "DO NOT WEAR HELMET WHILE SEATED" shall be visible from each seating location.

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BUILD SPECIFICATION

RESCUE BUMPER COMPARTMENT

The bumper extension shall have three (3) compartments. There shall be two (2) compartments outboard of the frame rail, each capable of storing a Hannay Rescue Reel. There shall be one (1) compartment between the chassis frame rails to store hydraulic tools.

A single lid shall cover all three (3) compartments. The lid shall be 1/8" NFPA compliant aluminum tread plate with stainless steel hinges and single point lift/turn latches. The compartment lid shall have two (2) pneumatic spring devices, one (1) at each end.

Compartment shall have a surface mounted light near door opening that will be automatically activated when door is opened, and switched for compartment door ajar warning system provided in cab.

Rubber bumpers shall be provided as required to prevent door from hitting cab.

The following shall be located in the bumper:

- One (1) Hannay hydraulic hose reel(s) capable of storing 100' of dual line hydraulic hose. The rewind button for each reel shall be located adjacent to the reel it controls.
 - The hydraulic reel shall be equipped with 100' of Amkus hydraulic hose. The hose shall be Red in color.
 - The hydraulic reel shall connect to the hydraulic pump with Amkus hydraulic hose.

SHOP NOTES

Location only. Pigtail hose included with the Amkus Ultimate quote.

- One (1) Hannay EF2016-17-18 hydraulic hose reel(s) capable of storing 100' of dual line hydraulic hose. The rewind button for each reel shall be located adjacent to the reel it controls.
 - The hydraulic reel shall be equipped with 100' of Amkus hydraulic hose. The hose shall be Blue in color.
 - The hydraulic reel shall connect to the hydraulic pump with Amkus hydraulic hose.

SHOP NOTES

Location only. Pigtail hose included with the Amkus Ultimate quote.

- Low air pressure supply shall be from the mobile breathing air system shall be provided in the front bumper extension. A quick connection coupling, a shut-off valve, pressure regulator and 0-150 psi gauge shall be provided on a control panel in the front bumper extension
- Mounting provisions for one (1) ZIONSVILLE FIRE DEPARTMENT supplied hydraulic cutter(s).
- Mounting provisions for one (1) ZIONSVILLE FIRE DEPARTMENT supplied hydraulic spreader(s).
- Two (2) 18" Onscene LED compartment lights will be provided under the lid covering the extended front bumper compartments.
- Two (2) 18" Onscene LED lights will be provided under the front bumper extension, one (1) per side.

AIR HORN(S)

The air horn(s) shall be supplied and installed by the cab/chassis manufacturer.

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FRONT TOW PROVISIONS

The front tow provisions shall be supplied and installed by the cab/chassis manufacturer.

EXHAUST

The exhaust system shall be as provided by cab/chassis manufacturer. No other alternation or modifications are required.

The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the apparatus or equipment to excessive heating.

Exhaust pipe discharge shall be directed away from any operator's position.

Where parts of the exhaust system are exposed so that they are likely to cause injury to operating personnel, protective guards shall be provided.

RADIO INSTALLATION

There shall be two (2) ZIONSVILLE FIRE DEPARTMENT supplied radio(s) installed in the cab/chassis. Each radio shall be installed per manufacturers requirements and wired for proper 12 volt power and ground.

THREE (3) ANTENNAS - RAIL MOUNTED CAB ROOF

There shall be one (1), radio antenna rail(s) provided and installed on the roof of the cab/chassis. The rails shall be constructed of aluminum, forming a two piece box design. The top section shall be removable for easy access to the individual antenna wiring. Total of three (3), antenna bases shall be provided and installed in each rail. The bases shall include a minimum of 20' of LMR195 cable. The antenna wiring shall enter the cab roof at a single point under the end of the rail. The end of each radio antenna shall be routed to a location determined by the ZIONSVILLE FIRE DEPARTMENT.

Due to multiple configurations of antenna whips, the Manufacturer shall provide the antenna base, and ZIONSVILLE FIRE DEPARTMENT shall provide the whip.

MAP BOX

A map box shall be provided in the cab.. The map box shall be securely fastened to the cab interior per NFPA 1901 standards. It shall be fabricated of 1/8" smooth aluminum and painted with a black or gray textured powder coat paint finish for durability and finished appearance.

The map box shall be built per the FD supplied CAD drawings in the sales folder.

HUB AND NUT COVERS

Front and rear wheels shall be provided with stainless steel hub caps and wheel nut covers.

MUDFLAPS

There shall be rubber mudflaps furnished and installed behind each set of tires.

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BUILD SPECIFICATION

REAR CAB AREA LAYOUT

CAB INTERIOR CABINETS - OVER REAR FACING JUMP SEATSHEAD

There shall be two (2) overhead cabinet(s) provided on interior of cab, directly over the rear facing jump seats. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum, and painted with a dark gray hammer tone powder coat paint finish for a hard durable surface. Each cabinet shall be approximately 14" high x 14" deep x 26" wide.

A shelf will be provided directly under the chassis air conditioner connecting the two (2) overhead cabinets. There will be a 2" lip on the front and rear of the shelf and painted to match the overhead cabinets.

SHOP NOTES

Shelf will be provided under AC, between the (2) overhead cabinets.

The above cabinet(s) shall have lift-up type door(s) with dry-erase outer surface. Doors will have locking door latches.

SHOP NOTES

Doors will have locking latches.

- One (1) 12 volt terminal block(s) installed to provide 12 VDC power for equipment supplied by the ZIONSVILLE FIRE DEPARTMENT. Exact location shall be determined at the pre-construction meeting.

SHOP NOTES

Wire battery direct and locate in the streetside overhead compartment

SHELF BETWEEN OVERHEAD CABINETS

There shall be one (1) shelf located between the two (2) rear facing overhead cab cabinets, to be made from 1/8" smooth aluminum and powder coated hammertone grey.

CAB INTERIOR DUPLEX 120 VOLT OUTLET

There shall be two (2) 120 volt outlet(s) located in the interior of the cab. The location of the outlet will be determined at the pre-construction meeting.

SHOP NOTES

Locate (1) 120 Volt outlet on the engine tunnel to supply outlet strip and make it GFCI. Locate second outlet in the curbside overhead cabinet.

OUTLET STRIP

There shall be one (1) 120 volt outlet strip(s) approximately 2' long with straight blade household type outlets provided on the interior of apparatus body. 15 ampere circuit breaker protection shall be provided for each strip. Exact location shall be specified by the ZIONSVILLE FIRE DEPARTMENT at the pre-construction meeting.

- The receptacle shall be 15 amp, straight-blade (NEMA 5-15R).

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BUILD SPECIFICATION

CAB INTERIOR CABINET - CURBSIDE ON REAR WALL

There shall be one (1) full height cabinet provided in the cab's curbside interior for storing ZIONSVILLE FIRE DEPARTMENT dri-type diving suits. The cabinet shall be constructed of 1/8" smooth finish aluminum and finished with a dark gray hammer tone powder coat for a hard and durable surface. The cabinet shall be approximately 28" wide x 20" deep, and consume the area from the door to rear wall and from floor to within a few inches of the cab roof.

A hanger bar will be provided across the top cabinet for hanging dive suits.

Heavy duty cargo netting will be provided on the front of the cabinet to secure the dive suits

- There shall be one (1) OnScene Solutions LED Nightstik mounted vertically inside the cabinet. The LED Nightstik shall be a 36" section.
- There shall be one (1) OnScene Solutions cargo straps provided to secure the stored equipment.

TWO (2) MAN BENCH SEAT

In the rear area of the cab, between the two (2) rear facing jump seats will be a 2-man bench seat used for changing into rescue dive suits. The seat shall be fabricated of 3/4" exterior grade plywood with 3" thick foam and Duraware heavy duty fabric covering.

Storage shall be provided under the seat with an open front facing to the rear of the truck.

Final design and layout shall be determined at the pre-construction meeting.

BACKBOARD COMPARTMENT DIVIDER

The Body Manufacturer will provide a vertical compartment divider in the chassis cab's streetside exterior rear compartment. This compartment is where the ZIONSVILLE FIRE DEPARTMENT furnished backboards will be stored.

BACKBOARD COMPARTMENT CARGO STRAPS

There shall be two (2) OnScene Solutions cargo straps provided to secure the backboards stored in the cab's rear exterior streetside compartment.

DUAL FUEL FILLS

There shall be one (1) Cast Products fuel fill door located in the streetside exterior wheel well panel and one (1) Cast Products fuel fill door located in the curbside exterior wheel well panel, behind the rear axle. The fill doors shall have a spring-loaded hinged door and a permanent label with the text "DIESEL FUEL ONLY".

SHOP NOTES

Dual curbside and streetside fuel fills will be provided.

CAB DOOR INTERIOR REFLECTIVE STRIPING

All cab door interiors will have reflective chevron striping applied, covering the lower 24" of the door. A reflective stripe will be installed around the interior edge of each door. The colors of the chevron and stripe will be determined at the pre-construction meeting.

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BUILD SPECIFICATION

BODY DESIGN

The importance of public safety associated with emergency vehicles requires that the construction of this vehicle meet the following specifications. These specifications are written to establish the minimum level of quality and design.

It is the intent of these specifications to fully describe the requirements for a custom built emergency type vehicle. In order to extend the expected service life of this vehicle, the body module shall be removable from the chassis frame and be capable of being installed on a new chassis.

The sheet metal material requirements, including alloy and material thickness, throughout the specifications are considered to be a minimum.

The fabrication of the body shall be formed sheet metal. Formed components shall allow the ZIONSVILLE FIRE DEPARTMENT to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the ZIONSVILLE FIRE DEPARTMENT from such repair and shall NOT be used.

Following construction of the subframe, which supports the apparatus body, the sheet metal portion of the body shall be built directly on the subframe. The joining of the subframe and body shall be of a welded integral construction.

The sheet metal fabrication of the body shall be performed using inert gas continuous feed welders only. The entire body shall be welded construction. The use of pop rivets in any portion of structural construction may allow premature failure of the body structure. Therefore, pop rivets shall NOT be used in the construction of the structural portions of the body. This includes side body sheets, inner panels of compartment doors, and any other structural portions of the body.

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EXTERIOR ALUMINUM BODY

The fabrication of the body shall be constructed from aluminum 3003H-14 alloy smooth plate. This shall include compartment front panel, vertical side sheets, side upper rollover panels, rear panels and compartment door frames.

The body compartment floors and exterior panels shall be constructed with not less than 3/16" (.187) aluminum 3003H-14 smooth plate. Interior compartment dividing walls shall be constructed with not less than 1/8" (.125) aluminum 3003H-14 smooth plate. Lighter gauge sheet metal will not be acceptable in these areas.

The door side frame openings shall be formed "C" channel design. An electrical wiring conduit raceway running the full length of exterior compartments shall be provided. This raceway shall contain all 12 volt wiring running to the rear of the apparatus, permitting easy accessibility to wiring.

Individual compartment modules, with dead air space voids between compartments, shall not be an acceptable method of compartment construction.

The compartments shall be an integral part of the body construction. Compartment floors from front of body to ahead of rear axle, also from rear axle to rear of body shall be single one-piece sections. Compartment floors shall be preformed, then positioned in body and welded into final position.

Compartment floors shall have a "sweep-out" design with door opening threshold positioned lower than compartment floor, permitting easy cleaning of compartments. Angles, lips, or door moldings are not acceptable in the base of compartment door opening. One-way rubber drain valves shall be provided in compartment floors so that a water hose may be used to flush-out compartment area.

All exterior seams in sheet metal below frame, and around the rear wheel well area shall be welded continuous to prevent moisture from entering compartments. All other interior seams and corners shall be sealed with silicone based caulk prior to painting.

Only stainless steel bolts, nuts, sheet metal screws and/or aluminum screws shall be used in mounting exterior trim, hardware and equipment.

Exterior compartments shall have louvers in lower back wall of compartment for ventilation.

ROOF CONSTRUCTION

The roof shall be integral with the body and shall be all welded construction. The roof shall be reinforced with 2" x 2" tubing running the full width of the body. All seams in the roof area shall be welded prior to paint to prevent entry of moisture.

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BUILD SPECIFICATION

BODY SUBFRAME

To assure proper body alignment and clearance, the body subframe shall be constructed directly on the chassis.

The chassis frame rails shall be fitted with 1/4" custom extruded UHMW polyethylene rail cap to isolate the body frame members from direct contact with chassis frame rails.

The body subframe shall be constructed from 6061T6 aluminum alloy tubing. Subframe shall consist of two (2) 2" x 6" x 1/4" aluminum tubes, the same width as the chassis frame rails, NO EXCEPTION. Welded to this tubing shall be crossmembers of 2" x 6" x 1/4" aluminum. These crossmembers shall extend the full width of the body to support the compartments. Crossmembers shall be located at front and rear of the body, below compartment divider walls, and in front and rear of wheel well opening. Additional aluminum crossmembers shall be located as necessary to support walkway or heavy equipment.

To form the frame, the tubing shall be beveled and welded at each joint using 5356 aluminum alloy welding wire.

BODY MOUNTING

The body subframe shall be fastened to the chassis frame with a minimum of eight (8) spring loaded body mounts. Each mount shall be configured using a two-piece encapsulated slide bracket. The two (2) brackets shall be fabricated of heavy duty 1/4" thick steel and shall have a powder coat finish to prevent any corrosion. Each mounting assembly shall utilize two (2) 3/4" diameter x 6" long grade 8 bolts and two (2) heavy duty springs. The assembly design shall allow the body and subframe to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the spring mounting system shall eliminate any stress from being transferred into the body. The spring loaded body mounts shall also prevent frame side rail or body damage caused by unevenly distributed stress and strains due to load and chassis movement.

Body mountings that do not allow relief from chassis movement will not be acceptable.

BUILT-IN HYDRAULICALLY DRIVEN RESCUE TOOL SYSTEM

Intent

It is the purpose and intent of these specifications to describe a chassis mounted central hydraulic drive system designed and engineered specifically for the simultaneous operation of high pressure intensified rescue tool supply circuits. Under these specifications and contract, associated drive components and control systems required for complete operation of such systems shall be provided by body and tool manufacturers.

Any and all parts or accessories not specifically mentioned herein but necessary to furnish a complete unit shall be supplied by the body manufacturer. The following specifications indicate the minimum requirements including all parts, accessories, equipment and safety features, whether mentioned herein or not.

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BUILD SPECIFICATION

Scope and General Description

The apparatus shall be equipped with an on-board AMKUS Ultimate hydraulic rescue tool system capable of powering specified tool circuits simultaneously. The system shall be designed for 10,500 PSI nominal operating pressure and shall be compatible to AMKUS hydraulic oil.

The primary hydraulic pump system shall include, but not be limited to, a transmission mounted power takeoff (PTO), hydraulic pump, hydraulic control valve assembly, reservoir, filtration system, hydraulic oil cooler, and electrical control system. This system shall provide all necessary hydraulic requirements and controls to properly operate the secondary stage high pressure intensifiers. All system component flow rates and pressure requirements shall be balanced and matched so that volumetric and overall efficiency is maximized at times of simultaneous component operation.

Compliance to NFPA Standards

All system components shall meet or exceed pressure drop, flow velocity, maximum operating pressure and torque safety margin factors as recommended by NFPA, JIC, SAE, and ISO standards organizations. The furnished hydraulic rescue portable and fixed rescue equipment shall be in full compliance to applicable NFPA standards.

Performance

The hydraulic system shall be designed to provide near-constant hydraulic flow up to the maximum operating pressure of 10,500 PSI for each hydraulically independent tool circuit. The operating conditions, such as tool force, tool direction, or hose length, of any circuit shall not affect the performance of any of the other circuits.

Variable Engine Speed Compatibility

The fixed hydraulic rescue tool system shall be capable of providing constant output at variable engine speeds. The engine RPM range shall be subject to many variable factors such as other hydraulically driven equipment and fire pump. The exact operating RPM shall be determined prior to installation by engineering and shall be subject to available horsepower, gearing and other critical design factors.

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BUILD SPECIFICATION

Hydraulic Pump

The hydraulic pump shall be AMKUS Model K3-112-K and shall be driveshaft-driven from an OEM provided Chelsea or Muncie hot shift clutch-shift power take-off mounted on the side of the Allison automatic transmission. The PTO system and installation shall be in compliance with applicable NFPA #1901 standards for similar applications. NFPA required interlocks shall be provided to prevent engagement unless the transmission is in neutral, the park brake is set and the engine is at idle.

A locking toggle PTO switch shall be provided on the cab dash to engage the system. A green indicator light shall be provided adjacent to the switch to indicate system engagement. The engagement switch and warning light shall be labeled "HRT SYSTEM".

All necessary hydraulic oil requirements for the proper operation of system components shall be provided by a single section, variable volume axial piston pump assembly. Pump shall be of the pressure compensated, load sense feedback control type with a maximum system pressure setting of 4000 PSI and load sense differential control pressure not to exceed 200 PSI at 50% flow control ramp stroke. Pump volumetric displacement shall be such as to supply the proper overall GPM and PSI requirements needed for independent or simultaneous operation of all system components and equipment at a maximum of 1800 engine RPM.

Pump design shall incorporate an internal pre-charge system of inlet housing and be capable of normal operating speeds of 2800 RPM and pressures of 4000 PSI. Pump shall be of the cast steel case housing and mounting flange construction with external adjustment provisions for maximum compensator pressure and load sense differential (to include maximum volume stop when required).

Overall system design shall provide for a minimum of three (3) PSI positive pump inlet pressure at maximum simultaneous flow and pressure requirements. Pump ramp/de-ramp generation shall be properly engineered and controlled by the valving system logic network as to minimize ramp oscillation, high-pressure surges and volumetric instability. Pump case flushing required only when needed for cooling requirements during long periods of standby operation. Single or multiple section constant displacement pumps are not acceptable.

Hydraulic Fluid Reservoir

A 35-gallon AMKUS Model HRG-110 5000-07-27 hydraulic fluid reservoir shall be provided. The reservoir shall be constructed of a minimum of eight (8) gauge steel and a minimum of two (2) internal flow baffles for proper oil circulation. A 3/4" IPT drain boss and plug and clean out/ strainer access cover shall be installed. All return lines shall be discharged hydraulic fluid directly into tank, through filter assembly, not less than 6" below normal operating fluid level. Volumetric capacity of reservoir shall be such as to provide for proper flow velocity, cooling and deof oil. Assembly shall be flex mounted if attached to chassis frame rail.

The reservoir shall also be equipped with a combination pressurized fluid filler, breather assembly with removable five hundred micron strainer, combination fluid level sight gauge and thermometer, cooling system temperature control switch.

The reservoir will be mounted in the transverse, upper roof compartment.

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Hydraulic Oil Filtration

The hydraulic system shall be equipped with fluid filter on the return line and high-pressure filter on the discharge side of the system. The hydraulic system shall be provided with a suction side strainer. The hydraulic system shall include a spin on cartridge suction line filter with a minimum of ten (10) micron filtering capacity. Filter flow capacity shall provide for minimum restriction of return flow. Filter assembly shall include an integral 15 PSI bypass valve and be equipped with a filter condition indicating device. Note: a pressure gauge shall not be acceptable. A top mounted inside tank, cartridge insert, return filter shall be provided.

The hydraulic filter and strainer shall be equipped with shut-off valves or provisions to prevent loss of hydraulic fluid from the system during changing of such devices. The installer shall provide adequate clearance and accessibility for filter maintenance, as well as hydraulic oil filling and drainage.

Hydraulic Fluid Cooling System

An Amkus Model HEA-40-10 5000-07-0027 air to hydraulic fluid cooler shall be installed to cool hydraulic fluid. The cooler system shall be of sufficient BTU per hour cooling capacity to provide for a maximum system oil temperature of ambient air plus 30 degrees Fahrenheit when all component systems are in simultaneous and continuous operation. Cooling system core shall be of sufficient flow capacity so that pressure drop across cooler headers (inlet to outlet) does not exceed 30 PSI at required flow. Pressure and flow bypass valving shall be provided to prevent over pressurization of assembly.

Air flow shall be provided by an integrally mounted 12 volt electric or hydraulic motor driven fan assembly of required CFM flow capacity. Mounting of cooling systems requiring airflow supply provided by chassis engine cooling system fan is not acceptable. Fan motor shall be thermostatically controlled to provide for a minimum operating oil temperature of 90 degrees Fahrenheit and maximum as stated. The cooling system shall provide for automatic on/off control of fan with hydraulic system engagement or shutdown (Operator control not required).

The cooler flow core and fan drive assembly shall be independently flex cushion mounted and located on chassis to provide for minimum air flow restriction and shall not be effected by engine heat or exhaust system heat inclusion.

Hydraulic System Plumbing, Hoses, and Fittings

The hydraulic system for the six (6) tool system shall be equipped with high pressure hydraulic hoses rated at 125% of working pressure of the designed system. The hoses shall be installed with sweep-type low friction loss corrosion resistant female swivel connections. The hoses shall be installed with mechanical and abrasion protection coverings and clamps.

All hydraulic hoses shall meet or exceed the following specifications: Each hose assembly (hose with hose end fittings), except for pump section hose shall be fitted with JIC 37 degree swivel fittings located at each point of hose and component connection. All pressure line hoses shall comply with SAE 100 R9 specifications. Suction line hose shall be a minimum of 2" nominal inside diameter and comply with requirements under SAE 100 R4. All hydraulic hoses shall be fully installed and ready for operation.

The Amkus Model FK-6 fitting kit and adaptors to be of the steel type designed for hydraulic system use. All pipe thread fittings are to be coated with liquid Teflon pipe sealer before assembly. Use of Teflon tape shall not be acceptable. Hydraulic quick check disconnect fittings of the valved type as manufactured by Parker Hannifin Corporation or approved equal shall be installed in the main pressure inlet section and outlet work ports of the valve assembly for diagnostic testing.

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Hydraulic Fluid

Ten (10) Amkus #990000001005 model MV-1 5-gallon pails of hydraulic fluid shall be supplied.

Valve Plate Assembly

The six (6) tool system shall be provided with a complete valve plate assembly. The compact assembly shall incorporate control valve assembly, intensifiers, and required equipment. The unit shall include an Amkus VPA-6 5000-07-00412 valve mounting plate assembly; including tubing fittings check valves to pre-assemble valve.

Valve Mounting Plate Assembly

The six (6) tool system shall be provided with a complete valve plate mounting assembly, AMKUS Model VPA-6. The Valve Plate Mounting Assembly shall be designed for easy service ability of intensifiers and control valves.

Control Valve Assembly

The system shall be provided an Amkus Model SPSV-351 5000-07-0001 control valve assembly for each High Pressure Circuit. All required hydraulic control functions of the intensifier drive circuits shall be supplied within a single multisectional closed center control valve assembly. Assembly shall be of the modular integrated, screw cartridge valve/manifold circuit design having stackable control sections for each drive circuit, and shall be designed to provide for additional drive circuit installations with only minor system modification.

The valve assembly shall consist of a control section for each intensifier operation. Each section of the assembly shall be fully post pressure compensated to provide proper flow and pressure regulation to each drive circuit independent of the operating requirements of other circuits in simultaneous operation. Each section, when stacked to make a complete assembly, shall provide all pressure inlet, tank return, load sense network, drive circuit porting, and control functions required.

Each of the intensifier control sections shall provide electric solenoid operated on control, automatic pressure sequenced dual set flow controls with fully adjustable flow and pressure settings and intensifier pre-charge control valving. The regulated flow output shall be post (after directional valve) pressure compensated by means of cartridge valve assembly and shall have internal load sense logic network controls required.

High Pressure Intensifier

The secondary oil supply system shall be driven by the primary pump and control valve central hydraulic system and shall consist of one (1) Amkus Model HPP 5000-03-0017 high pressure oil to oil type intensifiers for each high pressure circuit. Each intensifier shall consist of an axial piston motor drive group with a direct interconnecting axial rotational force plate ramp supplying force and drive requirements of the axial piston high pressure pump group.

The intensification pressure ratio shall be approximately 4:1 and be capable of developing a continuous intensified flow up to a maximum normal operating pressure of 12,500 PSI. The flow transmission factor shall be approximately 0.21:1 with a normal primary system drive flow rate of 7.5 GPM. Intensified (secondary oil supply output) flow rate shall be automatic high/low flow sequence controlled by system pressure/force requirements and shall be fully adjustable to supply a wide range of tool operating cycle speeds and high/low step-down initiation pressures.

Each intensifier shall be a single unitized assembly consisting of the motor drive and high pressure pump piston rotational groups, internal fill and output valving on each pump piston, internal high pressure piston prefill network, high pressure system adjustable relief valve, reverse connection protection valving, case over pressurization protection and all required intensifier component parts. Intensifiers of the motor/pump close coupled type or of the reciprocating differential area piston type are not acceptable. This unit shall be designed to supply a smooth, uninterrupted intensified oil flow output for rapid cycle operational speeds and predictable force characteristics of the rescue tool.

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BUILD SPECIFICATION

Electrical Control System

An Amkus Model EDP-351-6 5000-07-0048, 12-volt relay power distribution system, shall provide the control of the six (6) tool hydraulic system electrical valves and components. All relays and control system switching circuits shall be fused and arc suppression protected.

The installer or chassis manufacturer shall provide an electronic controlled variable set constant speed engine governor control system. Unit shall be set to automatically raise and hold constant the engine RPM required for proper hydraulic pump output to ensure intensifier drive output as the number of circuits and their loads change. Control module for governor shall be chassis mounted in a readily accessible location.

"On-Off" Control

The main control panel shall be equipped with an AMKUS RMC-300 5000-07-0092, "on-off" switch for tool operation. The switch shall be labeled on instructions intended use and function.

Pendent Control

The control of six (6) intensifier drive circuits and cable reel(s) shall be provided by two (2) Amkus Model EPC-630C 5000-07-0184 remote hand held pendant control modules. The control cable shall be of the high abrasion, oil, chemical, weather, and flame resistant polymeric jacket type to meet or exceed requirements of UL1277, IEEE383 and ICEA specifications.

This units shall be hard wired to chassis mounted power relay system with thirty (30) feet of multi-conductor control cable.

Wye "Y" Control Cable

To permit multiple pendant controls, an Amkus Model EPC-Y wye control cable with dual plug-in locations shall be provided.

Hydraulic Hose Reels

Hydraulic hose reels as specified will be furnished with hydraulic hose as follows:

- Two (2) Hannay 100 hydraulic hose reels shall be supplied and mounted by the Body Manufacturer in the front bumper extension.
 - One (1) 100 length of Amkus dual flow hydraulic hose shall be provided on each reel. The hose shall supply pressurized fluid to a tool and return fluid back to the power unit reservoir. These twinned hoses shall be constructed with double steel interior wire braiding and rubber exterior coating. The hose shall be burst tested to at least two (2) times of the pump operating pressure 21,000 psi.
 - One (1) 100 section of the hose shall be: RED
 - One (1) 100 section of the hose shall be: BLUE
 - Each section of hose shall include quick connect couplings on one (1) end to attach to the hydraulic tool and the other end shall connect to the Hannay reel.
 - Each reel shall be equipped with two (2) 10 sections of high pressure hydraulic supply hoses with JIC fittings from intensifier to reel.

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BUILD SPECIFICATION

- Two (2) Hannay 150 hydraulic hose reels shall be supplied and mounted by the Body Manufacturer in the Compartment S2.
 - One (1) 150 length of Amkus dual flow hydraulic hose shall be provided on each reel. The hose shall supply pressurized fluid to a tool and return fluid back to the power unit reservoir. These twinned hoses shall be constructed with double steel interior wire braiding and rubber exterior coating. The hose shall be burst tested to at least two (2) times of the pump operating pressure 21,000 psi.
 - One (1) 150 section of the hose shall be: BLACK
 - One (1) 150 section of the hose shall be: YELLOW
 - Each section of hose shall include quick connect couplings on one (1) end to attach to the hydraulic tool and the other end shall connect to the Hannay reel.
 - Each reel shall be equipped with two (2) 30 sections of high pressure hydraulic supply hoses with JIC fittings from intensifier to reel.

SHOP NOTES

There will need to be two (2) control pendants provided with the system. Locate (1) in compartment S2 and (1) in compartment C2. Exact location will be determined at the pre paint inspection.

Amkus Ultimate System Power Take Off

A Chelsea PTO will be installed by the Body Manufacturer to the chassis transmission to provide power to the Amkus Ultimate System.

10" REAR STEP BUMPER

The full width rear bumper shall be constructed from 2" x 2" x 1/4" aluminum tubing frame and covered with 3/16" NFPA compliant aluminum tread plate. The bumper shall extend from the rear vertical body panel 10" and provide a rear step with a minimum of 1/2" space at body for water drainage.

REAR TOW EYES

There shall be two (2) heavy duty rear mounted tow eyes securely attached to the chassis frame and mounted above the rear bumper. The tow eyes shall be fabricated from 1" thick steel plate and be chrome plated.

GROUND LIGHTS

Two (2) OnScene Solutions 9" LED Nightstik ground lights shall be mounted below the rear bumper.

WHEEL WELL EXTERIOR PANEL

The exterior panel of the body wheel well enclosure shall be constructed from 1/8" aluminum smooth plate.

DIEFORMED BEADED EDGE BODY FENDERS

A die formed beaded edge shall be provided along the radius of the wheel well opening for a finished appearance.

WHEEL WELL LINERS

The wheel wells shall be provided with an easily removable polymer, circular inner fender liner. The inner liner shall be bolted to the wheel well with stainless steel bolts and spaced away from the wheel well so the liner will not accumulate dirt or water.

ZIONSVILLE FIRE DEPARTMENT

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BUILD SPECIFICATION

SCBA BOTTLE COMPARTMENTS

Two (2) SCBA compartments shall be provided, one (1) each side of the apparatus body at the rear wheel well area. Each compartment shall have a Cast Products aluminum door assembly with a positive catch latch installed on the exterior of the wheel well panel. Each compartment shall have a 8" diameter aluminum tube behind the wheel well panel, attached to the Cast Products door assembly. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

SCBA BOTTLE COMPARTMENTS

There shall be two (2) SCBA compartments located adjacent to the rear wheels. There shall be one (1) on each side of the apparatus body. Each compartment shall be capable of storing three SCBA bottles (not more than 5-3/4" in diameter). Each compartment shall have a vertically hinged door and a positive catch latch installed on the exterior of the wheel well panel. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

PAINT FINISH - SINGLE COLOR

The body shall be painted with a single color of PPG Delfleet® Evolution paint as described above.

Prior to the assembly and reinstallation of exterior components; i.e. warning and DOT lights, handrails, steps, door hardware, and miscellaneous items, an isolation tape, or gasket shall be used to prevent damage to the finish painted surfaces. These components shall be fastened to body using either a plastic insert into body metal with stainless steel screws or zinc coated nutserts into body surface using stainless steel bolts to prevent corrosion from dissimilar metals.

Touch-up paint shall be provided with completed vehicle.

- Paint Color: Match cab/chassis supplied paint color.

BODY UNDERCOATING

The entire underside of apparatus body shall be sprayed with black automotive undercoating. Undercoating shall cover all areas to retard corrosion under the apparatus.

UNDERCOAT WARRANTY

The undercoating shall be provided with a warranty by its manufacturer for the lifetime of the vehicle. The re-spray warranty shall be transferable between vehicle owners. Should the coating applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

PAINT WARRANTY

The vehicle shall be provided with a ten (10) year non-prorated warranty to the original owner. Warranty is provided by PPG Inc. A warranty sheet with all conditions and maintenance procedures shall be provided with the delivered vehicle.

COMPARTMENT INTERIOR FINISH

The compartment interior (below exterior drip rail line) shall be treated with phosphoric acid and epoxy primer will be applied 1.0 mil thick. All body seams will be caulked with urethane seam sealer and painted with an epoxy primer and (Two) 2 coats of textured Zolatone paint. Zolatone catalysts will be added to the Zolatone to help in resisting moisture and provide a more durable finish. Paint color shall be gray.

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BUILD SPECIFICATION

ROOF COMPARTMENT INTERIOR FINISH

The roof compartment shall be treated with phosphoric acid and epoxy primer will be applied 1.0 mil thick. All body seams will be caulked with urethane seam sealer and painted with an epoxy primer and (Two) 2 coats of textured Zolatone paint. Zolatone catalysts will be added to the Zolatone to help in resisting moisture and provide a more durable finish. Paint color shall be gray.

REFLECTIVE STRIPING AND LETTERING

The apparatus will be lettered and striped by the Body Manufacturer as per the ZIONSVILLE FIRE DEPARTMENT's instructions.

All retroreflective materials shall conform to the requirements of ASTM D 4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

All retroreflective materials used that are colors not listed in ASTM D 4956, Section 6.1.1, shall have a minimum coefficient of retroreflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees.

Any printed or processed retroreflective film construction used shall conform to the standards required of an integral colored film as specified in ASTM D 4956, Section 6.1.1.

The exact lettering and striping layouts will be determined at the pre-construction meeting.

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BUILD SPECIFICATION

EXTERIOR COMPARTMENT DOORS

ROLL-UP DOOR CONSTRUCTION - ROBINSON (ROM)

The apparatus shall be equipped with Robinson Series III roll-up exterior compartment doors. Robinson roll-up doors shall be complete with the following features;

- Doors shall be front roll with drum positioned at upper front portion of compartment to afford maximum clearances and head room for mounting equipment to ceiling of compartment
- There shall be a non-abrasive side brush seals
- Magnetic door ajar system must be integrated in lift bar handle and the retainer block to signal open door. No mechanical switches or switches interior to the compartment shall be used
- Every slat must have interlocking end shoes to prevent slat from moving side-to-side and binding the door
- Between each slat must be a co-extruded PVC inner seal to prevent metal-to-metal contact and to repel moisture. This inner seal is not visible to detract from appearance of door
- Slat are to have interlocking joints with a folding locking flange to provide security and prevent penetration by sharp objects
- Slat to be double-wall extrusion 1.366" high by .315" thick. Exterior surface to be flat and interior surface to be concave to prevent loose equipment from interfering with door operation
- Latch system to be a full width one piece lift bar operable by one (1) hand
- A 2" wide finger pull integrated into the bottom rail extrusion for easy one (1) hand opening and closing
- Clip system that connects the curtain slats to the operator drum which allows for easy tension adjustment without tools
- Each roll-up door shall have a 4" diameter counterbalance operator drum to assist in lifting the door.
- Track shall be one-piece aluminum that has an attaching flange and finishing flange incorporated into its design
- Drip rail will have specially designed seal that prevents the seal from scratching the door
- Bottom rail extrusion must have smooth back to prevent loose equipment from jamming the door
- Bottom rail to have "V" shaped double seal to prevent water and debris from entering the compartment
- Standard replacement parts to be shipped from the United States and available in as little as 48 hours

Each shutter door shall decrease the compartment door frame opening approximately 2.00" in width and approximately 4.50" in height for the bottom section of door assembly.

EXTERIOR ROLL-UP DOOR FINISH - SATIN

The roll-up doors shall have a satin aluminum finish on the door slats and the door trim components.

The specified retroreflective stripe material shall be applied on the roll-up compartment doors. The stripe shall be precision machine cut for each door slat of the roll-up doors. Under no circumstance will the stripe material be cut on roll-up door surface.

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BUILD SPECIFICATION

BODY HEIGHT MEASUREMENTS

The vertical body dimensions shall be as follows:

AHEAD OF REAR AXLE

	<u>Description</u>	<u>Dimension</u>
A	Bottom of Subframe to Top of Body	84.0"
B	Bottom of Subframe to Bottom of Body	25.0"
C	Vertical Door Opening	
	-with roll-up door	67.5"
	-with hinged door	71.5"

ABOVE REAR AXLE

	<u>Description</u>	<u>Dimension</u>
D	Vertical Door Opening - Above Rear Wheel	
	-with roll-up door	34.0"
	-with hinged door	37.0"

BEHIND REAR AXLE

	<u>Description</u>	<u>Dimension</u>
E	Bottom of Subframe to Bottom of Body	20.0"
F	Vertical Door Opening	
	-with roll-up door	62.0"
	-with hinged door	66.0"

GENERAL

	<u>Description</u>	<u>Dimension</u>
G	Bottom of Drip Rail to Top of Body	33.5"

(Dimensions are generic and subject to change during the actual design process)

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BUILD SPECIFICATION

UPPER BODY COMPARTMENTS

The forward transverse compartment shall be 90.0" wide x 23.0" long x 28.5" deep. There shall be five (5) compartments parallel to the sides of the body, two (2) on the Driver's side and three (3) on the Passenger's side. Each of these compartments shall be approximately 65.0" wide x 26.0" long x 28.5" deep. The compartments shall be separated by stationary vertical partitions located under each door sill. Each compartment shall be integral with the body construction, and will not be bolted or add-on modules. The outside walls of each compartment will be double walled to prevent equipment from denting the outside painted surface.

Each compartment shall have a lift-up type compartment door hinged on the outboard side. Each door shall be fabricated from 3/16" aluminum tread plate. Each door shall have two (2) pneumatic type cylinders, one (1) at each end, attached to cast aluminum brackets mounted to the interior surface of the door to hold the door in both the opened and closed positions. Each door shall be mounted using 16" long, equally spaced, 14 gauge stainless steel hinges, with 1/4" stainless steel pin. The gravity-driven, sealed, ball-style tilt switch shall be mounted to one of the cast aluminum mounting brackets to activate the door open indicator system and the interior compartment light. A polyester barrier film gasket shall be placed between stainless steel hinge and the body mounting surface as necessary to prevent corrosion caused by dissimilar metals.

Each compartment door shall overlap a 2" vertical lip on the body roof to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

Each compartment shall have one (1) horizontally mounted OnScene Solutions 18" LED Night Stik on the underside of the door that will be automatically activated when the door is opened and wired to the NFPA required hazard warning light provided in cab.

SHOP NOTES

Note: the Floor dry hopper shall be under its own upper body compartment door - similar to West Hempfield

All upper body compartment doors will be locking, and the handle shall be the tailgate latch style.

SIDE ROOF COMPARTMENT - SHELF TRAC

There shall be five (5) roof compartment(s) provided with horizontally mounted Shelf Trac on front and rear walls for vertical partition installation.

ROOF COMPARTMENT - VERTICAL PARTITION

There shall be seven (7) vertical partition(s) provided in the roof compartment(s). The partitions shall be designed for holding equipment in place during travel. Each partition shall be fabricated from 3/16" smooth aluminum and bolted to specified Shelf Trac for ease of adjustment.

SHOP NOTES

Two (2) of these vertical partition walls will run long ways in the curbside middle upper body compartment and will store (1) Stokes basket and (1) little giant ladder on end - reference most updated sales drawing for layout.

UPPER BODY WALKWAY

A recessed walkway shall be provided recessed at the center of the roof area. The walkway shall be finished with NFPA compliant 3/16" aluminum tread plate with continuously welded seams to prevent moisture penetration into apparatus body. Drains shall be installed in the walkway to allow moisture to drain to the ground through flexible drain hose.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

WALKWAY LIGHTS

Four (4) OnScene Solutions 9" LED Night Stik lights provided to illuminate the upper body walkway area. The lights shall be activated when the parking brake is set.

Each light shall be mounted in a polished cast aluminum housing to protect against damage from personnel or equipment.

ROOF ACCESS STAIRWAY

The rear of the body shall be provided with a recessed center stairway approximately 34" wide. Stairs treads shall be formed 3/16" NFPA compliant aluminum tread plate with reinforcement as necessary.

STAIRWAY HANDRAILS

There shall be two (2) handrails provided, one (1) on each side wall of recessed center stairway. The handrails shall be angled for optimum use during ingress or egress of the upper walkway area.

Handrails shall be NFPA compliant 1-1/4" extruded aluminum tubing with chrome plated end stanchions.

STAIRWAY LIGHTS

Four (4) OnScene Solutions 9" LED Night Stik lights provided to illuminate the stairway area. The lights shall be activated when the parking brake is set.

Each light shall be mounted in a polished cast aluminum housing to protect against damage from personnel or equipment.

SHOP NOTES

Lights are for stairway.

STEP COMPARTMENT(S) - LOWER

There shall be two (2) compartment(s) located in the roof access stairway area. Each compartment shall have a horizontally hinged door with a D-ring handle. Each compartment shall be manufactured to prevent road debris, dirt and moisture from entering the enclosure. The compartment(s) shall be 26" wide x 8" high x the maximum appropriate dimensions based upon requirements for structural integrity of the body.

Each Compartment shall have an OnScene Solutions LED Night Stik that will be automatically activated when the door is opened and wired to the NFPA required hazard warning light provided in the cab.

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BUILD SPECIFICATION

STEP COMPARTMENT - UPPER

There shall be one (1) upper compartment located in the roof access stairway area. The compartment shall have a horizontally hinged door with a D-ring handle. The compartment shall be manufactured to prevent road debris, dirt and moisture from entering the enclosure. The compartment shall be approximately 26" wide x 8" high x depth of equipment.

Each Compartment shall have an OnScene Solutions LED Night Stik that will be automatically activated when the door is opened and wired to the NFPA required hazard warning light provided in the cab. Devices to secure equipment, compartment dividers, or UHMW plastic angles, or sheeting will be used for storage of specified equipment as required to prevent damage to equipment.

The compartment will be designed to store the following equipment:

- One (1) 28' 2-section ladder(s). Manufacturer, model number and size of the ladder(s) shall be provided during the pre-construction meeting.
- One (1) 16' roof ladder(s). Manufacturer, model number and size of the ladder(s) shall be provided during the pre-construction meeting.
- One (1) 10' folding ladder(s). Manufacturer, model number and size of the ladder(s) shall be provided during the pre-construction meeting.
- Three  ke pole(s). Manufacturer, model number and length of pike pole(s) to be provided during the pre-construction meeting.

FOLD-DOWN STEP

There shall be one (1) fold-down step located at the bottom of the roof access stairway to reduce the distance from the ground to the first step. The step shall manually fold up into the stairway during travel. The step shall activate the "Hazard Warning Light" in the cab when not in the stowed position.

REAR BODY HANDRAILS

There shall be two (2) vertical handrails on the rear of the body. Handrails shall be NFPA compliant 1-1/4" extruded aluminum tubing with chrome plated end stanchions.

BODY WIDTH DIMENSIONS

The body shall be 100.0" wide, not including drip rail or non-permanent fixtures. Interior compartment depth dimensions shall be:

<u>Area Description</u>	<u>Dimension</u>
Transverse Area:	95.5"
- Above Top of Subframe	
Compartment Depth:	24.5"
- Below Top of Subframe	
- Ahead of Rear Axle	
Compartment Depth:	23.5"
- Below Top of Subframe	(Eng. Note)
- Behind the Rear Axle	

(Dimensions are generic and subject to change during the actual design process)

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

STREETSIDE COMPARTMENT - FRONT (S1)

The interior useable compartment width shall be approximately 56.0" wide.


The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be two (2) 1,000 lbs. slide-out tray(s) with an OnScene Solutions base approximately 70" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- A vertical tray divider will be provided and bolted in the above slide-out tray. The divider will extend approximately to the compartment door opening and the depth of the tray. 
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

- One (1) Hannay ECR1616-17-18 cable reel(s) capable of storing 150' of 10/3 electric cable. The rewind switch for each reel shall be located adjacent to the reel it controls.
 - The cable reel shall be equipped with 150' of 10/3 SEOW yellow cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.
 - One (1) Akron model EJB, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall include:
 - A 12" pigtail that terminates in an L5-30 configuration to match the cable on the cord reel. The outlet configuration shall include:
 - One (1) L5-20 single twist lock receptacle
 - One (1) L5-20 single twist lock receptacle
 - One (1) L5-20 single twist lock receptacle
 - One (1) L5-20 single twist lock receptacle
 - One (1) EJB vertical apparatus mounting bracket - treadplate
- One (1) Hannay EF1520-17-18 low pressure air hose reel(s) capable of storing 200' of low pressure air hose. The rewind button for each reel shall be located adjacent to the reel it controls.
 - The hose reel shall be equipped with 200' of 3/8 low pressure air hose. Molded plastic ball clamp shall be provided on the hose to stop it at the 4-way roller. The hose shall be Red in color.
 - The air supply shall be from the mobile breathing air system. A reel shut-off valve, pressure regulator, and 0-150 psi gauge shall be provided on an aluminum control panel next to the air reel.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- The controls for the specified light tower(s).
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- One (1) 3-1/2" x 3-1/2" black plastic louvered vent shall be provided in lower compartment.
- The 12 volt electrical distribution panel shall be located in the streetside front lower compartment.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. Tray(s) shall be vertically adjustable.

SHOP NOTES

Add custom slanted brackets for the Hydraulic Cutters and Spreaders - See updated sales drawing - this will be similar to Richmond #671 - with the (2) small aluminum storage boxes in the void space created

- 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/white in color.
- There shall be two (2) 1,000 lbs. slide-out tray(s) with a OnScene Solutions base approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.

SHOP NOTES

These trays will be approx 23" wide and mount side by side, similar to compartment S1

- 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- A vertical tray divider will be provided and bolted in the above slide-out tray. The divider will extend approximately to the compartment door opening and the depth of the tray.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.

SHOP NOTES

Cut out (2) notches in the extended floor, (1) on each forward and rear wall to route hydraulic hoses from cord reels to preconnect to tools.

- One (1) Hannay hydraulic hose reel(s) capable of storing 150' of dual line hydraulic hose. The rewind button for each reel shall be located adjacent to the reel it controls.
 - The hydraulic reel shall be equipped with 150' of Amkus hydraulic hose. The hose shall be YELLOW in color.
- One (1) Hannay hydraulic hose reel(s) capable of storing 150' of dual line hydraulic hose. The rewind button for each reel shall be located adjacent to the reel it controls.
 - The hydraulic reel shall be equipped with 150' of Amkus hydraulic hose. The hose shall be BLACK in color.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S3)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be one (1) 150 lbs. slide out and down tray(s) with an OnScene Solutions base approximately 30" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) vertical compartment partition dividing compartment into left and right sides located in compartment.

SHOP NOTES

(Removable) between ASME storage and back of trays to separate.

- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- Air storage module consisting of six (6) 6,000 psi, ASME air storage cylinders.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S4)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with an OnScene Solutions base approximately 94" deep and as wide as the compartment layout or door opening permits, capable of extending out either side of the body located above the level of the chassis frame rails.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) transverse module(s) for the following long tools and equipment:
- Ten (10) 3/4" thick, full 4' x 8' sheets of plywood without altering the size of the wood. **NO EXCEPTION**
- There shall be one (1) air bag storage module(s). The make, model and exact dimensions of the air bags shall be provided during the pre-construction meeting.

SHOP NOTES

This will hold (1) FD supplied 36" diameter x 4" high Low Pressure air bag - locate on the bottom side of the transverse plywood storage module.

- There shall be one (1) OnScene Solutions cargo straps provided to secure the stored equipment.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

STREETSIDE COMPARTMENT - REAR (S5)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be two (2) slide-out smooth aluminum vertical tool board(s) approximately 24" deep.
 - The tool board(s) will be horizontally adjustable mounted on shelf trac on compartment floor.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on both sides of the toolboard. The striping shall be 2" wide and red/white in color.
- There shall be one (1) vertical compartment partition dividing compartment into left and right sides located in compartment.

SHOP NOTES

Vertical partition wall approx 30" back into compartment to separate compartments S5/C5.

- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- One (1) Eagle Sidewinder X2, two (2) position filling station(s) with cascade controls.

SHOP NOTES

Make sure when ordering that the fill station comes with the aux. exterior fill port,

- The fill station fill whip(s) shall terminate in a high pressure 4,500 psi, CGA-347 threaded SCBA connectors.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CURBSIDE COMPARTMENT - FRONT (C1)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. Tray(s) shall be vertically adjustable.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with an OnScene Solutions base approximately 24" deep and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

- One (1) Hannay ECR1616-17-18 cable reel(s) capable of storing 150' of 10/3 electric cable. The rewind switch for each reel shall be located adjacent to the reel it controls.
 - The cable reel shall be equipped with 150' of 10/3 SEOW yellow cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.
 - One (1) Akron model EJB, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall include:
 - A 12" pigtail that terminates in an L5-30 configuration to match the cable on the cord reel. The outlet configuration shall include:
 - One (1) L5-20 single twist lock receptacle
 - One (1) L5-20 single twist lock receptacle
 - One (1) L5-20 single twist lock receptacle
 - One (1) L5-20 single twist lock receptacle
 - One (1) EJB vertical apparatus mounting bracket - treadplate
- One (1) Hannay EF1520-17-18 low pressure air hose reel(s) capable of storing 200' of low pressure air hose. The rewind button for each reel shall be located adjacent to the reel it controls.
 - The hose reel shall be equipped with 200' of 3/8 low pressure air hose. Molded plastic ball clamp shall be provided on the hose to stop it at the 4-way roller. The hose shall be Red in color.
 - The air supply shall be from the mobile breathing air system. A reel shut-off valve, pressure regulator, and 0-150 psi gauge shall be provided on an aluminum control panel next to the air reel.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- The cab tilt control pendant.
- One (1) 120/240 VAC load center.
SHOP NOTES
Locate 120 volt panel and Frog D on the forward bulkhead wall
- The FRC FROG-D generator gauge panel.
SHOP NOTES
Locate 120 volt panel and Frog D on the forward bulkhead wall
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- One (1) 3-1/2" x 3-1/2" black plastic louvered vent shall be provided in lower compartment.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with a OnScene Solutions base approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
 - A vertical tray divider will be provided and bolted in the above slide-out tray. The divider will extend approximately to the compartment door opening and the depth of the tray.
- There shall be one (1) OnScene Solutions heavy duty, slide-out vertical tool board(s).
 - The tool board material shall be .190 smooth aluminum sheet.
 - The tool board(s) will be bolted to compartment floor.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on both sides of the toolboard. The striping shall be 2" wide and red/white in color.
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C3)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be one (1) adjustable shelf/shelves approximately 30" deep.
- There shall be one (1) air bag storage module(s). The make, model and exact dimensions of the air bags shall be provided during the pre-construction meeting.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- Air storage module consisting of six (6) 6,000 psi, ASME air storage cylinders. Note: These are the same cylinders specified in Compartment S3.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C4)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.

- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with an OnScene Solutions base approximately 94" deep, capable of extending out either side of the body located above the level of the chassis frame rails.
- There shall be one (1) transverse module(s) for long tools and equipment which extends to the opposite side of the body.
- There shall be one (1) air bag storage module(s). The make, model and exact dimensions of the air bags shall be provided during the pre-construction meeting.

SHOP NOTES

This will hold (1) FD supplied 36" diameter x 4" high Low Pressure air bag - locate on the bottom side of the transverse plywood storage module.

- There shall be one (1) OnScene Solutions cargo straps provided to secure the stored equipment.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CURBSIDE COMPARTMENT - REAR (C5)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a Robinson roll-up door with an exterior satin aluminum finish.


- A keyed cylinder lock shall be provided in the bottom portion of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan / splash guard shall be provided with the rollup door.

Compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT COMPONENTS

SHOP NOTES

Slope floor back 2 degrees in the cribbing storage area

- There shall be vertically mounted shelf trac for shelving installation.
- There shall be two (2) adjustable shelf/shelves approximately 30" deep. 
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. Tray(s) shall be vertically adjustable.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) 750 lbs. slide-out tray(s) with an OnScene Solutions base approximately 70" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
 - A vertical tray divider will be provided and bolted in the above slide-out tray. The divider will extend approximately to the compartment door opening and the depth of the tray.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

- There shall be two (2) vertical compartment partition dividing compartment into left and right sides located in compartment.

SHOP NOTES

One (1) of these vertical partition walls is from the storage hopper and existing vertical partition wall to prevent anything from falling behind stairs

- A storage hopper shall be provided in this compartment for approximately 150 pounds of "Floor-Dry". The hopper shall be loaded from the upper body compartment and shall dispense through a flex tubing stored inside the body. A PVC 1/4-turn valve shall be provided in the lower section of the body compartment to control floor-dry flow.

SHOP NOTES

Design storage hopper to match the updated sales drawing.

- The floor of the compartment above the frame rails, right of the vertical partition will be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ROOF ACCESS STAIRWAY

The rear of the body shall be provided with a recessed center stairway approximately 34" wide.

UPPER BODY COMPARTMENT - STREETSIDE

Above the exterior streetside compartments shall be an upper body compartment for storage of long equipment. The compartment shall be integral with the body construction, and will not be bolted or added on modules. The outside walls of compartment will be double walled to prevent equipment from denting the outside painted surface. The compartment shall be approximately (insert actual dimensions).

Access to the compartment shall be from a rear facing lift-up compartment door. Door shall be fabricated from 3/16" smooth aluminum with full length 14 gauge stainless steel hinge, with 1/4" stainless steel pin, 6" non-locking stainless steel "D" ring handle, and a gas cylinder door holder. A polyester barrier film gasket shall be placed between stainless steel hinge and any dissimilar metals as necessary to prevent corrosion. Door shall overlap body surface to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

Compartment shall have a flush mounted light near door opening that will be automatically activated when door is opened, and wired to compartment door ajar warning light provided in cab.

Devices to secure equipment, compartment dividers, or UHMW plastic angles, or sheeting will be used for storage of specified equipment as required to prevent damage to equipment.

The compartment will be designed to store the following equipment:

SHOP NOTES

This will hold ten (10) 4" X 4" X 14'6" lumber.

PLASTIC FLOOR AND SHELF TILE

All compartment floors, shelves, and trays shall be covered with Turtle Tile plastic interlocking grating.

- The plastic floor tile shall be black
- The plastic edge trim shall be yellow.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ROPE TIE-OFF OR PORTABLE WINCH RECEIVERS

The completed unit shall have an integrated receiver system for use with rope rescue accessories and/or electric winch components. Each receiver shall have the following load rating:

	<u>STRAIGHT PULL</u>	<u>SAFETY FACTOR</u>
Rope Tie Off:	600 LBS.	15:1
Winch:	1,000 LBS	4:1

The following items shall be provided to accomplish rope rescue or portable winch operations:

- Two (2) rope accessory receiver(s) shall be furnished and installed on the body roof. The receiver shall be manufactured using 1/4" wall receiver tube and 1/2" steel plate. The receiver assembly shall be powder coat painted. Each receiver shall have a push button detent pin provided to lock the rope accessory in place. Body reinforcements shall be added to the roof to increase the structural integrity and to provide a weight rating of 600 lbs. working load and 9000 lbs. maximum load using a 15:1 safety factor to match 1/2" diameter rope ratings.
- Two (2) rope tie off anchor accessories shall be provided with the completed vehicle. Each accessory shall include a push button detent pin to lock it in place. The tie off accessories shall have an eyelet for use with a rope rescue carabineer. A mounting bracket shall be provided to store each rope tie off accessory in a body compartment, location shall be determined by the ZIONSVILLE FIRE DEPARTMENT.
- One (1) Warn model M6000 SDP - 6,000 lb. 12 volt electric winch furnished with the completed apparatus. It shall be capable of being stored in a compartment and mounted to the apparatus by inserting the mounting point into a properly rated receiver. A minimum of 50' of 5/16" stranded galvanized steel cable with pinned utility hook shall be installed on the drum. A 12' remote control shall be provided with the assembly that permits the Operator to stand at a safe operating distance from the cable and winch.
- There shall be one (1) receiver tube(s) located at the front bumper for use with a portable winch or tie-off point accessory.
 - There shall be one (1) 12 volt plug with a quick connect used to power the portable winch.
 - There shall be one (1) rubber cover / plug for the receiver.
- There shall be one (1) receiver tube(s) located on the streetside of the body in the rearward portion of the wheel well panel for use with a portable winch or tie-off point accessory.
 - There shall be one (1) rubber cover / plug for the receiver.
- There shall be one (1) receiver tube(s) located on the curbside of the body in the rearward portion of the wheel well panel for use with a portable winch or tie-off point accessory.
 - There shall be one (1) rubber cover / plug for the receiver.
- There shall be one (1) receiver tube(s) located at the rear bumper for use with a portable winch or tie-off point accessory(s).
 - There shall be one (1) 12 volt plug with a quick connect used to power the portable winch.
 - There shall be one (1) rubber cover / plug for the receiver.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SIDE BODY PROTECTION - RUB RAIL

There shall be side rub rails provided below the compartment door openings on both the streetside and curbside. The rub rail shall be fabricated from 6063 extruded aluminum, measuring approximately 2-3/4" high x 1-3/8" thick with tapered aluminum end caps. The rub rail shall be bolted to the body using stainless steel bolts and 1-1/2" diameter x 5/8" thick rubber mount isolators to prevent damage to the body. The rails shall incorporate LED clearance marker lighting recessed into the rail fascia to avoid damage to the light in case of impact. The rub rail shall have an accessory mounting track integrated into the backside of the rail to allow mounting of accessories such as ground lighting.

- 3M™ Diamond Grade™ Conspicuity striping shall be provided in the rub rail. The striping shall be red/white in color.

ROLL-OUT AWNING STREETSIDE

A Carefree Mirage, 110 Volt AC powered, Lateral Arm Acrylic Patio Awning with Direct Response Electronics shall be installed on the apparatus body. The Direct Response Electronics includes easy-to-use controls and a Motion Detection System. The awning shall have a system to detect canopy motion, the most important element to prevent wind/weather damage. The awning shall automatically retract when the canopy reaches a certain level of movement - you determine the movement level on the control panel.

The awning shall activate the door ajar warning system in the cab when not in the stowed position.

The 110V motor shall be completely sealed and UL approved. The awning pitch shall be adjusted to up to 30"

The awning shall be approximately 22' wide with a 10' projection. (Size refers to box length, actual fabric length will be 8" shorter.)

The Mirage shall be covered by a "Two and Four" Limited Warranty - Two years 100% parts, labor, & freight on canopy, four years 100% parts, labor, and freight on motor, electronics, roller & hardware. Warranty covers manufacturer's defects only. Wind and rain damage are not covered.

SHOP NOTES

Awning will be 22' long.

AWNING HOUSING

The case color will be the standard, Polar White and re-painted to match body color.

- The awning fabric shall be Firesist HUV, Crimson Red (88003).

AWNING TREE LIMB GUARD

A custom tree limb guard will be mounted to the forward, upper streetside of the body to provide protection to the specified awning.

SHOP NOTES

Make the awning limb guard smooth aluminum, painted to match the upper body color.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

COMPARTMENT COMPONENTS DESCRIPTIONS

All interior compartment components shall be fabricated as follows:

ADJUSTABLE SHELVING HARDWARE

Adjustable shelving hardware shall be provided indicated in the numbered compartment list.

The shelving hardware shall include a minimum of four (4) aluminum shelf tracs mounted vertically on compartment side walls or vertical partitions. There shall be one (1) cast aluminum shelf bracket per vertical shelf trac to mount each shelf, tray, or adjustable storage module. Shelving hardware shall be of heavy duty quality with unlimited vertical adjustment settings.

ADJUSTABLE SHELF/SHELVES

Adjustable shelf/shelves shall be provided in exterior compartment as indicated in the numbered compartment list.

Shelves shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate with a 2" vertical flange along the front and rear edges. Shelves shall be designed to be used with flanges either in the upward position to hold various equipment on shelf, or in the downward position for sweep-out shelf surface.

All shelves shall be fully adjustable, from top to bottom of the compartment. There shall be at least four (4) vertical mounting channels and shelving hardware, two (2) each side of compartment. Shelving hardware shall be of heavy duty quality with unlimited vertical adjustment settings.

SLIDE-OUT EQUIPMENT TRAY - (400 LB CAPACITY)

Slide-out equipment tray(s) shall be provided in exterior compartment, as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Trays shall be built with a 3" vertical lip, with welded corners, to form a box type tray surface. Sliding tracks shall be Accuride 502 series. The length shall be per numbered compartment list and the extension shall be 100% of the slide length. Slides shall be constructed of formed steel with ball bearings mounted in triple track rails. The tray shall be rated for a maximum 400 lbs. evenly distributed load.

Tray(s) shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

HEAVY DUTY 100% EXTENSION EQUIPMENT SLIDE - (1,000 LB. CAPACITY)

Heavy duty slide-out equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Trays shall be built with a 4" high vertical lip with welded corners to form a box type tray surface. The tray shall be mounted on a slide frame constructed of anodized aluminum extrusion(s). The frame shall be assembled using stainless steel fasteners (no welds). Each slide shall use a three extrusion rail design utilizing twelve to sixteen (12 - 16) urethane rollers. Each roller shall contain two (2) precision roller bearings mounted in an aluminum hub with a molded on urethane cover. The rollers shall not lose contact with the rail extrusion during operation of the slide unit. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release). The slide shall lock in the closed and full extension positions. The slide shall be rated for a maximum evenly distributed load of 1,000 lbs.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

HEAVY DUTY 100% EXTENSION EQUIPMENT SLIDE - (750 LB. CAPACITY)

Heavy duty slide-out equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Trays shall be built with a 4" high vertical lip with welded corners to form a box type tray surface. The tray shall be mounted on a slide frame constructed of anodized aluminum extrusion(s). The frame shall be assembled using stainless steel fasteners (no welds). Each slide shall use a three extrusion rail design utilizing twelve to sixteen (12 - 16) urethane rollers. Each roller shall contain two (2) precision roller bearings mounted in an aluminum hub with a molded on urethane cover. The rollers shall not lose contact with the rail extrusion during operation of the slide unit. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release). The slide shall lock in the closed and full extension positions. The slide shall be rated for a maximum evenly distributed load of 750 lbs.

HEAVY DUTY 70% EXTENSION EQUIPMENT SLIDE TRANSVERSE (1,000 LBS. CAPACITY)

Heavy duty slide-out equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Each tray shall be built with a 4" high vertical lip with welded corners to form a box type tray surface. The tray shall be mounted on a slide frame constructed of anodized aluminum extrusion(s). The frame shall be assembled using stainless steel fasteners (no welds). Each slide shall use a two extrusion rail design utilizing twenty (20) urethane rollers. Each roller shall contain two (2) precision roller bearings mounted in an aluminum hub with a molded on urethane cover. Each slide shall have two (2) cable operated, spring loaded latches operated by two (2) large hand openings with red pull handles (Pull to Release). The slide shall lock in the closed and full extension position in two (2) directions. The slide shall be rated for a maximum distributed load of 1,000 lbs.

HEAVY DUTY EQUIPMENT TRAYS - SLIDE OUT AND DOWN (250 LBS. CAPACITY)

Heavy duty slide-out equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Each tray shall be built with a 4" high vertical lip with welded corners to form a box type tray surface. The tray shall be mounted on a slide frame constructed of anodized aluminum extrusion(s). The frame shall be assembled using stainless steel fasteners (no welds). Each slide shall use a two extrusion rail design utilizing four (4) urethane rollers. Each roller shall contain two (2) precision roller bearings mounted in an aluminum hub with molded on urethane cover. The roller shall not lose contact with the rail extrusion during operation of the slide unit. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release). The slide shall lock in the closed position. The slide shall be rated for a maximum evenly distributed load of 250 lbs.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

HEAVY DUTY EQUIPMENT TRAYS - SLIDE OUT AND DOWN (150 LBS. CAPACITY)

Heavy duty slide-out equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Each tray shall be built with a 4" high vertical lip with welded corners to form a box type tray surface. The tray shall be mounted on a slide frame constructed of anodized aluminum extrusion(s). The frame shall be assembled using stainless steel fasteners (no welds). Each slide shall use a two extrusion rail design utilizing four (4) urethane rollers. Each roller shall contain two (2) precision roller bearings mounted in an aluminum hub with molded on urethane cover. The roller shall not lose contact with the rail extrusion during operation of the slide unit. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release). The slide shall lock in the closed position. The slide shall be rated for a maximum evenly distributed load of 150 lbs.

SLIDE-OUT TOOL BOARD (SMOOTH ALUMINUM)

Slide-out tool board(s) shall be provided in the exterior compartment as indicated in the numbered compartment list.

Tool boards shall be fabricated of 3/16" (.188) aluminum 3003H-14 alloy smooth plate with double flange at the outer edge to provide an easy grip handle. The top and bottom of tool board shall be provided with Accuride 502 series slide tracks. The length shall be per numbered compartment list and the extension shall be 100% of the slide length. Slide tracks shall be constructed from formed steel with ball bearings in triple track rails. The board shall be rated for a maximum 200 lbs. evenly distributed load.

Tool board(s) shall utilize a pneumatic cylinder to hold the tool board in both the opened and closed positions. Both the upper and lower roller slide shall be mounted to Shelf Trac to allow the tool board to be adjusted horizontally for best fit in the compartment.

COMPARTMENT PARTITIONS

Vertical compartment partitions shall be provided as indicated in the numbered compartment list. Partitions shall be fabricated of 3/16" thick (.188) smooth aluminum with 1" "L" outer edge. Bolted angles shall be provided at top and bottom of partition to secure partition in place, but allow future removal without cutting of partition.

TRANSVERSE STORAGE MODULE

Transverse storage module for long equipment shall be provided as indicated in the numbered compartment list.

The module shall be fabricated from 1/8" (.125") thick smooth aluminum. Exact size and layout shall be approved prior to construction.

AIR BAG MODULE

An air bag module rack shall be supplied in the exterior compartment located as indicated in the numbered compartment list.

The module shall be fabricated of 1/8" (.125) smooth aluminum plate with individual sections for each air bag.

Circular notches shall be provided along the front edge for ease of removing air bags with gloved hand. Modules shall be large enough for specified air bag and matching plywood panels. Exact size and layout shall be approved prior to construction.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SCBA CYLINDER RACK

A spare SCBA cylinder storage rack shall be provided and located as indicated in the numbered compartment list.

The rack shall have a shell fabricated of 1/8" (.125) thick smooth aluminum. There shall be a 2" slope in the rack to keep the bottles from sliding out. The air bottle storage tubes shall be fabricated of PVC tube. There shall be rubber matting installed inside each storage tube for bottle protection.

REMOVABLE TOOL BOX - (PLASTIC)

Removable tool box(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

The tool box(s) shall be fabricated of 1/2" (.50) thick polypropylene and shall have handhold cut-out at each end. Exact dimensions and layout of the tool box shall be determined at the pre-construction meeting.

COMPARTMENT LIGHTING

Each enclosed equipment compartment greater than 4 ft³ (0.1 m³) in volume and having an opening greater than 144 in.² (92,900 mm²) shall have sufficient compartment lighting to provide a minimum of 2 fc (20 lx) at any location on the floor of the compartment without any shelves, dividers, or equipment in the compartment.

Compartments such as ladder tunnels, pike pole storage tubes, or underbody compartments designed around the volumetric requirements of specific equipment that can be removed without the use of article illumination shall not be required to have compartment lighting.

All compartments shall be equipped with OnScene Nightstik LED lights with the following minimum light requirements;

- Full Height Compartments, 54" Section (36 LED's)
- Wheel well Compartments, 36" Section (24 LED's)
- Rear Rescue Compartment, 54" Section (36 LED's)
- Low Compartments, 18" Section (12 LED's), Vertical
- Low Compartments, 36" Section (24 LED's), Horizontal

The OnScene Nightstik lights shall be rated at 100,000 hours of service and shall be provided with a 5 year free replacement warranty.

ELECTRIC CORD REEL

Electric cord reel(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

The 120 volt cord reel(s) shall be Hannay with electric rewind, equipped with fully enclosed 45 amp, three (3) conductor collector rings.

The 12 volt reel rewind system shall be directly wired to the chassis battery system with heavy duty stranded copper wire, with guarded finger type rewind button located within easy reach of the operator.

Each reel shall have a Hannay 4-way roller assembly to permit cable to feed directly off the reel and away from compartment. Plastic roller assemblies are not acceptable.

The wiring from the generator system shall be through Carflex electrical weatherproof conduit, with stranded copper wiring. The wiring shall terminate in a sealed conduit box at the reel with mechanical type connectors for quick removal of wiring.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

Cord Reel General Requirements

All permanently mounted cord reels shall be rated for continuous duty and installed to be accessible for removal, cord access, maintenance, and servicing.

The power rewind cord reel spool area shall be visible to the operator during the rewind operation, or the reel spool shall be encapsulated to prevent cord from spooling off the reel.

Rollers or guides shall be provided, where required, to prevent damage to the cord at reel spools or compartment openings.

Rewind Provision

Power rewind type reels shall have the control in a position where the operator can observe the rewinding operation.

If a reel is in an enclosure or out of direct view, the cord entry point to the enclosure shall be visible to the operator of the reel control.

The rewind control or crank shall not be more than 72 in. (1830 mm) above the operator's standing position. The rewind control shall be marked with a label indicating its function and shall be guarded to prevent accidental operation.

Cord

The reel shall be designed to hold 110 percent of the capacity needed for the intended cord length.

The wire size shall be in accordance with *NFPA 70*, Table 400.5(A), but in no case shall it be smaller than 12AWG. Electrical cord shall be Type SEOOW, Type SOOW, or Type STOOW.

A label that indicates the following information shall be provided in a visible location adjacent to any permanently connected reel:

- (1) Current rating
- (2) Current type
- (3) Phase
- (4) Voltage
- (5) Total cord length

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

POWER DISTRIBUTION BOX

Where a power distribution box is hardwired to the end of a cord that is stored on a fixed cord reel or other fixed storage means, the following requirements shall apply;

The remote power distribution box shall be listed for use in a wet location.

The distribution box shall be as follows:

- (1) Protected from corrosion
- (2) capable of being carried with a gloved hand
- (3) Designed to keep the exterior electrical components above 2 in. (51 mm) of standing water

Inlets, receptacles, circuit breakers, or GFCI devices shall not be mounted on the top surface of the horizontal plane.

Branch circuit breakers shall be installed in the remote power distribution box if the overcurrent device protecting the feed cord to the box is too large to protect the wiring supplying the devices plugged onto the distribution box.

Remote power distribution boxes shall have a light on the box to indicate the power is on. The light shall be visible in a 360 degree plane from a minimum of 200 ft (60 m) in complete darkness. The light shall be mechanically protected to prevent damage.

The hardwired portable cord connection to the box shall have strain relief and meet the intended usage requirements.

LOW PRESSURE AIR HOSE REEL

Air hose reel(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

The air reel(s) shall be Hannay, low pressure design, with electric rewind.

The 12 volt electrical rewind circuit shall be directly wired to the chassis battery system with heavy duty stranded copper cable. The rewind button shall be located adjacent to the hose reel within easy access of Operator.

Each reel shall have a Hannay 4-way roller assembly to permit cable to feed directly off the reel and away from compartment. **Plastic roller assemblies are not acceptable.**

Air hose shall have a ball clamp located near end of hose.

HYDRAULIC HOSE REEL

Hydraulic hose reel shall be Hannay high pressure, electric rewind, hydraulic hose reel with a capacity of 100' of dual hose.

The 12 volt electrical rewind circuit shall be directly wired to the chassis battery system with heavy duty stranded copper cable. The rewind button shall be located adjacent to the hose reel within easy access of Operator.

Each reel shall have a Hannay 4-way roller assembly to permit cable to feed directly off the reel and away from compartment. **Plastic roller assemblies are not acceptable.**

Hydraulic hose shall have a ball clamp located near end of hose.

SHOP NOTES

Noted that reel is a 100' reel.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

HYDRAULIC HOSE REEL

Hydraulic hose reel shall be Hannay high pressure, electric rewind, hydraulic hose reel with a capacity of 150' of dual hose.

The 12 volt electrical rewind circuit shall be directly wired to the chassis battery system with heavy duty stranded copper cable. The rewind button shall be located adjacent to the hose reel within easy access of Operator.

Each reel shall have a Hannay 4-way roller assembly to permit cable to feed directly off the reel and away from compartment. **Plastic roller assemblies are not acceptable.**

Hydraulic hose shall have a ball clamp located near end of hose.

SHOP NOTES

Noted that reel is a 100' reel.

Need correct model #.

BREATHING AIR STORAGE SYSTEM

Breathing air system shall be provided with an air storage module consisting of:

- Six (6) 6,000 psi ASME air storage cylinders which comply with 29 CFR 1910.169, "Air Receivers". Each cylinder shall be permanently stamped or identified in accordance with DOT or ASME regulations.

Each cylinder shall have a working pressure of 6,000 psi with a 3:1 safety factor. The nominal capacity of each cylinder shall be 481 cu.ft. at 6,000 psi, 70 degrees F, for a total air capacity of 2,886 cu.ft.

Each cylinder shall be interpipied with a factory set ASME type relief valve set at 6,600 psi and a shutoff valve. There shall be a label which reads, "HIGH PRESSURE - 6,000 psi BREATHING AIR".

If the air storage was cascaded the system would be capable of filling approximately sixty-six (66) 45 cu.ft. 2,216 psi, or forty (40) 45 cu.ft. 4,500 psi SCBA bottles (based on residual pressure of 500 psig).

The air cylinders shall be horizontally and securely mounted at both ends to comply with all DOT regulations. The mounting system shall be designed to withstand severe service to be expected of this type of apparatus.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

MOBILE FILL STATION - EAGLE SIDEWINDER X2

GENERAL ARRANGEMENT

The mobile fill station shall have the capacity for filling two (2) SCBA cylinders simultaneously or separately. The enclosure shall be designed to contain the impact of suddenly expanded high pressure air and all displaced fragments in the unlikely event of a cylinder or fill component rupture. The containment design shall feature a loading door that is trapped inside the fill enclosure cabinet frame when closed. The enclosure shall include an automatic, safety interlock to prevent filling unless the loading door is completely in the closed position and a safety relief valve to protect operators in the event that the SCBA fill pressure exceeds 4750 PSIG.

The external construction of the high pressure, breathing air fill station shall be appliance-like; using formed, fabricated steel structures and panels without visible welds, burrs or grinding marks.

SCBA FILL ENCLOSURE AND ACCESS DOOR CONTROL

The fill station must allow the complete fill process to be accomplished from the front and include an access door control that enhances the enclosure containment design, is simple to operate and requires minimal physical operator effort. Two (2) fill whips, each fitted with a cylinder fill adapter, shut-off valve and pressure bleed valve shall be located within the enclosure.

The access door assembly shall include two (2) integral, steel cylinder sleeves to secure the SCBA cylinders while being filled. The assembly shall include a handle permitting the operator to slide the access door clear of the enclosure frame and swing-out the cylinder sleeves towards the operator for loading and unloading cylinders with minimal effort.

The access door shall be supported on the enclosure frame with an adjustable bearing bushing on each side assuring a balanced and smooth rotation when opening and closing.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

SCBA CYLINDER FILL ENCLOSURE FLOW CONTROL SYSTEM

The SCBA cylinder fill control system shall include an air control panel with all components, devices and piping arrangement necessary to direct compressed high pressure breathing air to the SCBA cylinders being filled. (A)
The SCBA cylinder fill control system shall include a regulated air control panel with all components, devices and piping arrangement necessary to direct supplied compressed high pressure breathing air to the SCBA cylinders being filled. Additionally, an inlet CGA connection and flow valve shall be provided to direct high pressure breathing air from an external source to the air storage system. (B)

A cascade control system shall be included for the number of banks specified below. The cascade control system shall permit drawing down each air storage cylinder, independently of each other, while filling SCBA cylinders (C)

All air flow components and indicators must be labeled and mounted on a steel control panel located above the fill enclosure. (A, B, C)

The panel shall be painted in a matte shade with a textured finish to eliminate glare and enhance the visibility of gauges and indicators. The control panel shall be illuminated. The panel shall be designed so that it can slide forward, out of the compartment, and tipped down so that all piping and components are accessible for maintenance.

As a minimum, the air control panel must include the following:

- Inlet pressure gauge. (A)
- SCBA/SCUBA cylinder(s) fill control valve. (A)
- SCBA/SCUBA cylinder(s) fill pressure gauge. (A)
- Panel lights on/off switch. (A)
- Adjustable, 0-6000 PSI self-relieving regulator. (B)
- Regulator outlet pressure gauge. (B)
- Air storage fill, CGA inlet fitting and flow control valve. (B)
- Four (4) bank cascade control with a single valve and gauge per bank. (C)

The Sidewinder X2 fill station with 4-bottle cascade air controls will be approximately 33" wide x 44" high x 23" deep and weight 700 pounds.

STEP / GROUND LIGHTS

Step and ground lights shall be OnScene Solutions 9" LED Nightstik and be placed at any entry door and step where personnel climb on or descend from the apparatus to ground level. OnScene LED lights shall have 6 LED lights per 9" light, and shall be rated at 100,000 hours of service. On Scene Solutions LED lights shall have a 5 year free replacement warranty.

All of the required step and ground lights shall be activated when the parking brake is set.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

General

Any low voltage electrical systems or warning devices installed on the fire apparatus shall be appropriate for the mounting location and intended electrical load.

Where wire passes through sheet metal, grommets shall be used to protect wire and wire looms. Electrical connections shall be with double crimp water-tight heat shrink connectors.

All 12 VDC wiring running from front to back of vehicle body shall be run in full length electrical wiring raceway down each side of body.

Wiring

All electrical circuit feeder wiring supplied and installed by the fire apparatus manufacturer shall meet the requirements of NFPA Chapter 13.

The circuit feeder wire shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 % of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10 %. The use of star washers for circuit ground connections shall not be permitted.

All circuits shall otherwise be wired in conformance with SAE J1292, *Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring*.

Wiring and Wire Harness Construction

All insulated wire and cable shall conform to SAE J1127, *Low Voltage Battery Cable*, or SAE J1128, *Low Voltage Primary Cable*, type SXL, GXL, or TXL.

All conductors shall be constructed in accordance with SAE J1127 or SAE J1128, except where good engineering practice dictates special strand construction. Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application. Physical and dimensional values of conductor insulation shall be in conformance with the requirements of SAE J1127 or SAE J1128, except where good engineering practice dictates special conductor insulation. The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures. The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C), except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer's instructions. All ungrounded electrical terminals shall have protective covers or be in enclosures. Wire nut, insulation displacement, and insulation piercing connections shall not be used.

Wiring shall be restrained to prevent damage caused by chafing or ice buildup and protected against heat, liquid contaminants, or other environmental factors.

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BUILD SPECIFICATION

Wiring shall be uniquely identified at least every 2 ft (0.6 m) by color coding or permanent marking with a circuit function code. The identification shall reference a wiring diagram.

Circuits shall be provided with properly rated low voltage overcurrent protective devices. Such devices shall be readily accessible and protected against heat in excess of the overcurrent device's design range, mechanical damage, and water spray. Circuit protection shall be accomplished by utilizing fuses, circuit breakers, fusible links, or solid state equivalent devices.

If a mechanical-type device is used, it shall conform to one of the following SAE standards:

- (1) SAE J156, *Fusible Links*
- (2) SAE J553, *Circuit Breakers*
- (3) SAE J554, *Electric Fuses (Cartridge Type)*
- (4) SAE J1888, *High Current Time Lag Electric Fuses*
- (5) SAE J2077, *Miniature Blade Type Electrical Fuses*

Switches, relays, terminals, and connectors shall have a direct current (dc) rating of 125 % of maximum current for which the circuit is protected.

Power Supply

A 12 V or greater electrical alternator shall be provided. The alternator shall have a minimum output at idle to meet the minimum continuous electrical load of the vehicle, at 200°F (93°C) ambient temperature within the engine compartment, and shall be provided with full automatic regulation.

Minimum Continuous Electrical Load

The minimum continuous electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode during emergency operations:

- (1) The propulsion engine and transmission
- (2) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
- (3) The radio(s) at a duty cycle of 10 percent transmit and 90 % receive (for calculation and testing purposes, a default value of 5 A continuous)
- (4) The lighting necessary to produce 2 fc (20 lx) of illumination on all walking surfaces on the apparatus and on the ground at all egress points onto and off the apparatus, 5 fc (50 lx) of illumination on all control and instrument panels, and 50 percent of the total compartment lighting loads
- (5) The minimum optical warning system, where the apparatus is blocking the right-of way
- (6) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
- (7) Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

If the apparatus is equipped to tow a trailer, an additional 45 A shall be added to the minimum continuous electrical load to provide electrical power for the federally required clearance and marker lighting and the optical warning devices mounted on the trailer.

The condition of the low voltage electrical system shall be monitored by a warning system that provides both an audible and a visual signal to persons on, in, or near the apparatus of an impending electrical system failure caused by the excessive discharge of the battery set.

ZIONSVILLE FIRE DEPARTMENT

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BUILD SPECIFICATION

The charge status of the battery shall be determined either by direct measurement of the battery charge or indirectly by monitoring the electrical system voltage.

If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery or at the master load disconnect switch drops below 11.8 V for 12 V nominal systems, 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds.

A voltmeter shall be mounted on the driver's instrument panel to allow direct observation of the system voltage.

Electromagnetic Interference

Electromagnetic interference suppression shall be provided, as required, to satisfy the radiation limits specified in SAE J551/1, *Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*.

Wiring Diagram

A complete electrical wiring schematic of actual system shall be provided with finished apparatus. Similar or generic type electrical schematics shall NOT BE ACCEPTABLE.

Low Voltage Electrical System Performance Test

A low voltage electrical system test certification shall be provided with delivered apparatus.

12 VOLT MULTIPLEX CONTROL CENTER

The apparatus shall have a multiplexed 12 volt electrical system that will provide complete diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The system shall be node based to maximize stability so that failure of one node does not affect the operation of the other nodes. The system shall use shielded twisted-pair wire for transmission of system function signals. The shielded wire shall provide protection against EMI and RFI noise interruptions.

The multiplex system shall be responsible for providing power management functions as well as load shedding. The warning light system shall be controlled by the multiplex system. The system shall be capable of displaying text and/or graphic messages on a display module. The system shall be based on solid-state technology and shall include self-contained diagnostic indicators.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

BATTERY SYSTEM

The battery connectors shall be heavy duty type with cables terminating in heat shrink loom. Heavy duty battery cables shall provide maximum power to the electrical system. Where required, the cables shall be shielded from exhaust tubing and the muffler. Large rubber grommets shall be provided where cables enter the battery compartment.

Batteries shall be of the high-cycle type. With the engine off, the battery system shall be able to provide the minimum continuous electrical load for 10 minutes without discharging more than 50 percent of the reserve capacity and then to restart the engine. The battery system cold cranking amps (CCA) rating shall meet or exceed the minimum CCA recommendations of the engine manufacturer. The batteries shall be mounted to prevent movement during fire apparatus operation and shall be protected against accumulations of road spray, snow, and road debris. The batteries shall be readily accessible for examination, testing, and maintenance.

A means shall be provided for jump-starting the engine if the batteries are not accessible without lifting the cab of a tilt-cab apparatus.

Where an enclosed battery compartment is provided, it shall be ventilated to the exterior to prevent the buildup of heat and explosive fumes. The batteries shall be protected against vibration and temperatures that exceed the battery manufacturer's recommendation.

A master load disconnect switch shall be provided between the starter solenoid(s) and the remainder of the electrical loads on the apparatus. The starter solenoids shall be connected directly to the batteries.

Electronic control systems and similar devices shall be permitted to be otherwise connected if so specified by their manufacturer.

The alternator shall be wired directly to the batteries through the ammeter shunt(s), if one is provided, and not through the master load disconnect switch.

A green "battery on" pilot light that is visible from the driver's position shall be provided.

A sequential switching device shall be permitted to energize the optical warning devices and other high current devices required in minimum continuous electrical load, provided the switching device shall first energize the electrical devices required in minimum continuous electrical load within five (5) seconds.

BATTERY SWITCH

One (1) battery "On/Off" switch in cab located within easy reach of Driver with green "BATTERY ON" pilot light that is visible from the driver's position shall be provided. The switch and pilot light shall be supplied and installed by the cab/chassis manufacturer.

BATTERY SOLENOID

Battery switch shall consist of a minimum 200 ampere, constant duty solenoid to feed from positive side of battery.

BATTERY CONDITIONER

The battery conditioner shall be supplied and installed by the cab chassis manufacturer.

ENGINE COMPARTMENT LIGHT

Engine compartment light(s) shall be supplied and installed by the cab chassis manufacturer.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

CAB HAZARD WARNING LIGHT

A red "HAZARD" warning light shall be supplied and installed by the cab/chassis manufacturer. Light shall illuminate automatically to warn the Driver of the following when the apparatus parking brake is not fully engaged:

- Any passenger or compartment door is open
- Equipment rack is not in stowed position
- Light tower is extended

The light shall be labeled "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

BACK-UP ALARM

An electronic back-up alarm shall be supplied and installed by the cab/chassis manufacturer. The back-up alarm shall actuate automatically when the transmission gear selector is placed in reverse.

REAR VIEW CAMERA

The cab chassis provided rear view camera shall be installed on the rear of the body.

TAIL LIGHTS

Rear body tail lights shall be vertically mounted per Federal Motor Vehicle Safety Standards. The following lights shall be furnished:

- Two (2) Whelen amber LED 600 Series 60A00TAR turn signal lights
- Two (2) Whelen red LED 600 Series 60R00XRR stop/tail lights
- Two (2) Whelen Halogen 600 Series 60J000CR back-up lights with clear lens

Two (2) Whelen CAST-3V, 3-light polished aluminum bezels shall be provided, one (1) each side vertically mounted on the rear of the apparatus body for the above tail lights.

MIDSHIP MARKER/TURN SIGNAL

Two (2) Whelen LED midship body clearance marker/turn signal lights (T0A00MAR) shall be installed. There shall be one (1) light on each side of the body, in the wheel well, ahead of the rear axle. Both lights shall have an amber lens and operate with the chassis clearance marker and turn signals.

MARKER LIGHTS

The apparatus body shall be equipped with all necessary clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) regulations. All body clearance lights shall be LED to reduce the need for maintenance and lower the amp draw. Clearance lights shall be wired to the headlight circuit of the chassis.

REAR BUMPER MARKER LIGHTS

Two (2) Britax L427 dual face flexible mounted rear bumper markers shall be located, one (1) each side lower rear corner of body visible from driver mirrors.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

LICENSE PLATE MOUNTING BRACKET

There shall be one (1) Cast Products aluminum license plate mounting with chrome shielded license plate light mounted on the rear of the body.

ELECTRONIC SIREN

The siren control head shall be supplied and installed by the cab/chassis manufacturer.

SIREN SPEAKER

The siren speaker(s) shall be supplied and installed by the cab/chassis manufacturer.

REAR SCENE LIGHTS

There shall be one (1) Whelen Super LED 900 series (9" x 7") recess mounted scene lights (90C0ENZr) shall be provided on the upper rear body to light the work area immediately behind the vehicle to a level of at least 3 fc (30 lx) within a 10 ft x 10 ft (3 m x 3 m) square. Each light will have twenty-four LED diodes that draw a total of 4.0 amps, with 3000 Lumens. The light shall be a 8-32 degree gradient lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

The rear scene lights shall also be activated when the apparatus is in reverse.

TRAFFIC DIRECTIONAL LIGHT

Two (2) Tomar model 200-6 Amber LED traffic directional warning devices with dual control cable shall be located, one (1) each side on upper rear body. Controls shall be provided through individual switches on the switch panel or through the Weldon VMux Vista screen.

SHOP NOTES

Activate through Mux

- The traffic directional light shall be surface mounted on upper rear body.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

DAVID CLARK INTERCOM SYSTEM

A seven (6) position David Clark, model U3800, intercom system with radio interface at three (3) positions shall be provided:

- Driver position shall have radio interface capability
- Officer position shall have radio interface capability
- Four (4) crew seats shall have intercom only the two (2) forward facing seats and two (2) rearward facing seats.

The following components shall be supplied with this system:

- One (1)-U3800 Intercom unit (two (2) crew)
- One (1)-U3815 Radio interface module (Officer)
- One (1)-U3811 Radio interface modules (Driver)
- Two (2)-U3802 Intercom only (two (2) Crew)
- One (1)-U3815A Radio interface module (air fill station panel)
- Six (6)-H3442 Dual receiver headset
- Three (3) H6040 Handheld radio headset
- Three (3)-C6008 Handheld radio adapters
- One (1)-C3820 Power cable.
- Six (6)-Headset hangar hooks

The system shall also be provided with all interconnect cables and radio interface cables to connect to purchases 800 MHz radio mobile radio.

SHOP NOTES

Handheld radio adapter to link to a Motorola XTS5000

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

WARNING LIGHT PACKAGE

Each apparatus shall have a system of optical warning devices that meets or exceeds the requirements of this section.

The optical warning system shall consist of an upper and a lower warning level. The requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four warning zones. The four zones shall be determined by lines drawn through the geometric center of the apparatus at 45 degrees to a line drawn lengthwise through the geometric center of the apparatus. The four zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the apparatus.

Each optical warning device shall be installed on the apparatus and connected to the apparatus's electrical system in accordance with the requirements of this standard and the requirements of the manufacturer of the device.

A master optical warning system switch that energizes all the optical warning devices shall be provided.

The optical warning system on the fire apparatus shall be capable of two separate signaling modes during emergency operations. One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One mode shall signal that the apparatus is stopped and is blocking the right-of-way. The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission. When the master optical warning system switch is closed and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized. When the master optical warning system switch is closed and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized. The system shall be permitted to have a method of modifying the two signaling modes.

The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s). The front optical warning devices shall be placed so as to maintain the maximum possible separation from the headlights.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

UPPER LEVEL OPTICAL WARNING DEVICES

The upper-level optical warning devices shall be mounted as high and as close to the corner points of the apparatus as is practical to define the clearance lines of the apparatus. The upper-level optical warning devices shall not be mounted above the maximum height, specified by the device manufacturer.

ZONE A - FRONT WARNING LIGHTS

There shall be one (1) Whelen Edge FN72QLED LED 72" lightbar permanently mounted to the cab roof.

The lightbar configuration (streetside to curbside) shall be:

<u>SECTION</u>	<u>INTERNAL COMPONENTS</u>	<u>LENS COLOR</u>
1	Red Linear LED - Side Facing	Clear
2	Red Corner LED	Clear
3	Clear Linear LED	Clear
4	Red Linear LED	Clear
5	Clear Linear LED	Clear
6	Red Linear LED	Clear
7	Opticom	Clear
8	Opticom	Clear
9	Red Linear LED	Clear
10	Clear Linear LED	Clear
11	Red Linear LED	Clear
12	Clear Linear LED	Clear
13	Red Corner LED	Clear
14	Red Linear LED - Side Facing	Clear

All clear lights shall shut down when the parking brake is set to comply with "Blocking" mode requirements as outlined in NFPA 1901.

The lightbar shall be separately switched at the vista display in the cab.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

3M OPTICOM

One (1) 3M Opticom emitter light shall be installed either inside specified light bar, or on cab roof. The Opticom shall be activated with light bar and de-activated when the park brake is set and the vehicle is in blocking mode.

ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") red linear Super-LED lights provided, one (1) each side.

SHOP NOTES

Red lights with clear lens.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (90CC5FCR) and chrome flange.

UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") red linear Super-LED lights provided, one (1) each side.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (90CC5FCR) and chrome flange.

UPPER MID WARNING LIGHTS

There shall be four (4) Whelen 900 series (9" x 7") RED/CLEAR linear Super-LED lights provided, two (2) each side.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (90CC5FCR) and chrome flange.

ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") RED linear Super-LED lights provided, one (1) each side.

The lights shall be switched at the 12 volt control panel in the cab.

Each light shall have a clear lens (90RR5FCR) and chrome flange.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

LOWER LEVEL OPTICAL WARNING DEVICES

To define the clearance lines of the apparatus, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front axle centerline and as close to the front corner points of the apparatus as is practical.

The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corners of the apparatus as is practical. The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground for large apparatus, and 18 in. and 48 in. (460 mm and 1220 mm) above level ground for small apparatus.

A midship optical warning device shall be mounted right and the left sides of the apparatus if the distance between the front and rear lower-level optical devices exceeds 25 ft (7.6 m) at the optical center. Additional midship optical warning devices shall be required, where necessary, to maintain a horizontal distance between the centers of adjacent lower-level optical warning devices of 25 ft (7.6 m) or less. The optical center of any midship mounted optical warning device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

ZONE A - FRONT WARNING LIGHTS

The warning lights shall be supplied and installed by the cab/chassis manufacturer. They shall be Whelen lights to complete an NFPA compliant lower level warning light system.

The lights shall be switched at the Vista display in the cab.

ZONES B AND D - CAB INTERSECTOR LIGHT (CAB REAR CORNERS)

There shall be two (2) Whelen 500 series (5" x 2") Amber Linear Super-LED lights (50R02ZCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

ZONES B AND D - BODY INTERSECTOR LIGHT (BODY WHEELWELL AREA)

There shall be two (2) Whelen 500 series (5" x 2") RED linear Super-LED lights provided, one (1) each side.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (50R02ZCR) and chrome finished flange.

There shall be two (2) Whelen 500 series (5" x 2") AMBER linear Super-LED lights provided, one (1) each side.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (50R02ZCR) and chrome finished flange.

ZONES B AND D - BODY INTERSECTOR LIGHT (BODY REAR CORNERS)

There shall be two (2) Whelen 600 series (6" x 4") RED linear Super-LED lights provided, one (1) each side.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (60R02FCR) and chrome finished flange.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen 600 series (6" x 4") red linear Super-LED lights provided, one (1) each side.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (60R02FCR) and chrome finished flange.

REAR MID WARNING LIGHTS

There shall be two (2) Whelen 600 series (6" x 4") RED/AMBER linear Super-LED lights provided, one (1) each side.

The lights shall be switched at the Vista display in the cab.

Each light shall have a clear lens (60R02FCR) and chrome finished flange.

LINE VOLTAGE ELECTRICAL SYSTEM

ONAN PTO GENERATOR

The apparatus shall be equipped with an Onan Protec PTO generator system with a capacity of 35,000 watts at 120/240 VAC, 291/145 amps., single phase. Current frequency shall be stable at 60 hertz.

The transmission's PTO port and PTO, or the split shaft PTO, and all associated drive shaft components shall be rated to support the continuous duty torque requirements of the generator's continuous duty rating as stated on the power source nameplate.

Where the generator is driven by the chassis engine and transmission through a split shaft PTO, the driving compartment speedometer shall register when the generator drive system is engaged.

Where the generator is driven by the chassis engine and transmission through a split shaft PTO and a chassis transmission retarder is furnished, it shall be automatically disengaged for generator operations.

The direct drive generator shall be mounted so that it does not change the ramp breakover angle, angle of departure, or angle of approach as defined by other components, and it shall not extend into the ground clearance area.

The direct drive generator shall be mounted away from exhaust and muffler areas or provided with a heat shield to reduce operating temperatures in the generator area.

GENERATOR ENGAGEMENT

A "Generator Engaged" indicator shall be provided in the driving compartment to indicate that the generator shift has been successfully completed.

An "OK to Operate Generator" indicator shall be provided in the driving compartment to indicate that the generator is engaged (if not always engaged), the transmission is in the proper gear (if required, automatic transmissions only), and the parking brake is engaged (if applicable).

An interlock system shall be provided to prevent advancement of the engine speed in the driving compartment or at any operator's panel unless the parking brake is engaged, and the transmission is in neutral or the output of the transmission is correctly connected to a pump or generator instead of the drive wheels.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

WARRANTY PERIOD

Provided such goods are operated and maintained in accordance with Onan's written instructions, Onan warrants that the Protec YDCR series PTO generators shall be free from defects in material and workmanship for a period of five (5) years or one thousand (1,000) hours, whichever comes first, from the date of delivery to the first purchaser.

GENERATOR SPLASH GUARD

A powder coat painted splash cover shall be installed to reduce the amount of road spray on the frame mounted PTO generator. A V-ring seal shall also be installed in the cover to provide additional protection against contaminants reaching the generator front seals.

GENERATOR MOUNTING

The generator shall be mounted between the chassis frame rails. The generator mounting brackets shall be fabricated using heavy duty steel tubing, or structural channel. The generator mounting shall be bolted and removable so that the generator can be lowered from under apparatus for service, if necessary. The generator case shall not extend below the bottom edge of the apparatus body.

MANUALS AND SCHEMATICS

Two (2) complete manuals on parts list, maintenance, wiring schematics, hydraulic schematics, circuit boards, voltage regulator board and other components shall be provided on delivery.

POWER-TAKE-OFF GENERATOR DRIVE

There shall be a "Hot Shift" power-take-off (PTO) installed on the transmission PTO by the cab chassis manufacturer. The "Hot Shift" PTO is provided to allow the engagement of the PTO at higher engine RPM speeds. The PTO output shall be connected to the generator through hollow tube type driveline with heavy duty universals.

The engagement of the PTO shall be in the chassis cab with a rocker switch and red pilot light to note engagement of the PTO.

The power supply to the PTO engagement control shall be wired to the parking brake and a neutral position transmission switch to prevent engagement unless the vehicle is stopped and transmission has been placed in neutral.

ENGINE SPEED CONTROL

An engine speed auxiliary control device (high idle switch or throttle) shall be installed to maintain a stable cycle output from generator when the apparatus is parked.

An interlock shall prevent the operation of the engine speed auxiliary control device unless the parking brake is engaged and the transmission is in neutral or park, or the parking brake is engaged and the engine is disengaged from the drive wheels.

The engine shall be prevented from regulating its own engine speed during times when engine rpm control is critical for consistent apparatus functions such as generator, water pump, or aerial operation.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

GENERATOR MONITORING PANEL

To properly monitor the generator performance and load demand during operation, the generator installation shall be equipped with a full instrument monitor panel.

This unit shall be manufactured by FRC model FROG-D and mounted next to the circuit breaker panel. This generator output display shall consolidate five (5) generator monitoring instruments into one device. The display case shall be waterproof and have dimensions not to exceed 4 1/4" high by 4 1/4" wide by 3 1/4" deep.

The following continuous displays shall be provided with super bright LED digits more than 1/2" high:

- Generator frequency in hertz
- Line 1 current in amperes
- Line 2 current in amperes
- Generator voltage in volts

The program shall support the accumulation of elapsed generator hours and the monitoring of engine oil temperature. Generator hours and oil temperature shall be displayed at the push of a button.

LOADCENTER

The loadcenter shall be a Cutler Hammer, BR Series, specifically designed for protection and distribution of 120/240 volt AC, such as lighting and small motor branch circuits. The loadcenter enclosure shall be made of 16 gauge galvanized sheet steel. The galvanized coating provides corrosion protection and as such does not require paint. All trims used on the BR Loadcenter shall be chromate sealed and finished with electro disposition epoxy paint (ASA61) which exceeds requirements for outdoor and indoor applications. A combination surface/flush cover with integral door shall be supplied.

The loadcenter shall be UL / CSA listed, **NO EXCEPTIONS** will be allowed.

SHORE POWER INLET - BATTERY CHARGER

The above mentioned shore power inlet shall be wired into the chassis provided battery charger and shall supply 120 volt power to the two (2) specified 120 volt outlets specified in the chassis cab, directly over the rear facing jump seats.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

OUTLETS AND CIRCUITS

The generator shall supply the electrical equipment and outlets outlined below. Proper circuit protection shall be installed as noted:

- Four (4) 120 volt exterior outlets, two (2) each side near rear wheel well area.

SHOP NOTES


Two (2) 120 volt outlets per side of body will be provided.

- The receptacle shall be 20 amp, twist-lock (NEMA L5-20R).
- Two (2) 120 volt exterior outlets, one (1) each side rear of body.
 - The receptacle shall be 20 amp, twist-lock (NEMA L5-20R).
- Two (2) 120 volt outlets, one (1) each side of the front bumper extension.

SHOP NOTES

Outlets will be (1) on each side of front bumper extension.

- The receptacle shall be 20 amp, twist-lock (NEMA L5-20R).

 There shall be two (2) 120 volt outlet(s) located in the rear crew area of the cab. One (1) outlet per the two (2) overhead cabinets above the rear facing jump seats. Both outlets shall be connected to both the generator and the shorepower connection.

SHOP NOTES

Outlets will be located (1) in each of overhead cabinets in cab.

- The receptacle shall be 15 amp, straight-blade (NEMA 5-15R).

GENERAL REQUIREMENTS

Stability

Any fixed line voltage power source producing alternating current (ac) shall produce electric power at 60 Hz, ± 3 Hz when producing power at all levels between no load and full rated power. Any fixed line voltage power source shall produce electric power at the rated voltage ± 10 percent when producing power at all levels between no load and full rated power.

The maximum voltage supplied to portable equipment shall not exceed 275 volts to ground. Higher voltage shall be permitted only when used to operate fixed wired, permanently mounted equipment on the apparatus.

Conformance with National Electrical Code

All components, equipment, and installation procedures shall conform to *NFPA 70, National Electrical Code*, except where superseded by the requirements of this chapter. Where the requirements of this chapter differ from those in *NFPA 70*, the requirements in this chapter shall apply.

Where available, line voltage electrical system equipment and materials included on the apparatus shall be listed and used only in the manner for which they have been listed. All equipment and materials shall be installed in accordance with the manufacturer's instructions.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

Location Ratings

Any equipment used in a dry location shall be listed for dry locations. Any equipment used in a wet location shall be listed for wet locations.

Any equipment, except a PTO-driven generator, used in an underbody or under chassis location that is subject to road spray shall be either listed as Type 4 or mounted in an enclosure that is listed as Type 4.

If a PTO-driven generator is located in an underbody or under chassis location, the installation shall include a shield to prevent road spray from splashing directly on the generator.

Grounding

Grounding shall be in accordance with 250.34(A) and 250.34(B) of *NFPA 70*. Ungrounded systems shall not be used.

Only stranded or braided copper conductors shall be used for grounding and bonding.

The grounded current-carrying conductor (neutral) shall be insulated from the equipment-grounding conductors and from the equipment enclosures and other grounded parts.

The neutral conductor shall be colored white or gray in accordance with 200.6, "Means of Identifying Grounded Conductors," of *NFPA 70*.

Any bonding screws, straps, or buses in the distribution panelboard or in other system components between the neutral and equipment-grounding conductor shall be removed and discarded.

Bonding

The neutral conductor of the power source shall be bonded to the vehicle frame. The neutral bonding connection shall occur only at the power source. In addition to the bonding required for the low voltage return current, each body and each driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor.

The conductor shall have a minimum ampere rating, as defined in 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*, of 115 percent of the rated ampere on the power source specification label.

A single conductor that is sized to meet the low voltage and line voltage requirements shall be permitted to be used.

Ground Fault Circuit Interrupters

In special service vehicles incorporating a lavatory, sink, toilet, shower, or tub, 120 V, 15 or 20 A receptacles within 6 ft (1.8 m) of these fixtures shall have ground fault circuit interrupter (GFCI) protection. GFCIs integrated into outlets or circuit breakers or as stand-alone devices shall be permitted to be used in situations.

Power Source General Requirements

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

The power source shall be shielded from contamination that would prevent the power source from operating within its design specifications.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

Power Source Rating

For power sources of 8 kW or larger, the power source manufacturer shall declare the continuous duty rating that the power source can provide when installed on fire apparatus according to the manufacturer's instructions and run at 120°F (49°C) air intake temperature at 2000 ft (600 m) above sea level.

The rating on the power source specification label shall not exceed the declared rating from the power source manufacturer.

Access shall be provided to permit both routine maintenance and removal of the power source for major servicing. The power source shall be located such that neither it nor its mounting brackets interfere with the routine maintenance of the fire apparatus.

Instrumentation

If the power source is rated at less than 3 kW, a "Power On" indicator shall be provided. If the power source is rated at 3 kW or more but less than 8 kW, a voltmeter shall be provided.

If the power source is rated at 8 kW or more, the following instrumentation shall be provided at an operator's panel:

- (1) Voltmeter
- (2) Current meters for each ungrounded leg
- (3) Frequency (Hz) meter
- (4) Power source hour meter

The instrumentation shall be permanently mounted at an operator's panel. The instruments shall be located in a plane facing the operator. Gauges, switches, or other instruments on this panel shall each have a label to indicate their function.

The instruments and other line voltage equipment and controls shall be protected from mechanical damage and not obstructed by tool mounting or equipment storage.

An instruction plate(s) that provides the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

Operation

Provisions shall be made for placing the generator drive system in operation using controls and switches that are identified and within convenient reach of the operator.

Where the generator is driven by the chassis engine and engine compression brakes or engine exhaust brakes are furnished, they shall be automatically disengaged for generator operations.

Any control device used in the generator system power train between the engine and the generator shall be equipped with a means to prevent unintentional movement of the control device from its set position in the power generation mode.

If there is permanent wiring on the apparatus that is designed to be connected to the power source, a power source specification label that is permanently attached to the apparatus at the operator's control station shall provide the operator with the information required.

The power source, at any load, shall not produce a noise level that exceeds 90 dBA in any driving compartment, crew compartment, or onboard command area with windows and doors closed or at any operator's station on the apparatus.

Power Supply Assembly

The conductors used in the power supply assembly between the output terminals of the power source and the main overcurrent protection device shall not exceed 12 ft (4 m) in length.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115 percent of the amperage of the nameplate current rating of the power source.

If the power supply assembly connects to the vibrating part of a generator (not a connection on the base), the conductors shall be flexible cord or other fine-stranded conductors enclosed in metallic or nonmetallic liquid tight flexible conduit rated for wet locations and temperatures not less than 194°F (90°C).

Overcurrent Protection

Manually resettable overcurrent devices shall be installed to protect the line voltage electrical system components.

Power Source Protection

A main overcurrent protection device shall be provided that is either incorporated in the power source or connected to the power source by a power supply assembly.

The size of the main overcurrent protection device shall not exceed 100 percent of the rated amperage stated on the power source specification label or the rating of the next larger available size overcurrent protection device, where so recommended by the power source manufacturer.

If the main overcurrent protection device is subject to road spray, the unit shall be housed in a Type 4-rated enclosure.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

Branch Circuit Overcurrent Protection

Overcurrent protection devices shall be provided for each individual circuit and shall be sized at not less than 15 amps in accordance with 240.4, "Protection of Conductors," of *NFPA 70*.

Any panelboard shall have a main breaker where the panel has six or more individual branch circuits or the power source is rated 8 kW or larger.

Each overcurrent protection device shall be marked with a label to identify the function of the circuit it protects.

Dedicated circuits shall be provided for any large appliance or device (air conditioning units, large motors, etc.) that requires 60 percent or more of the rated capacity of the circuit to which it is connected, and that circuit shall serve no other purpose.

Panelboards

All fixed power sources shall be hardwired to a permanently mounted panelboard unless one of the following conditions exists:

- (1) All line voltage power connections are made through receptacles on the power source and the receptacles are protected by integrated overcurrent devices.
- (2) Only one circuit is hardwired to the power source, which is protected by an integrated overcurrent device.

The panel shall be visible and located so that there is unimpeded access to the panelboard controls. All panelboards shall be designed for use in their intended location. The panel(s) shall be protected from mechanical damage, tool mounting, and equipment storage.

Where the power source is 120/240 V and 120 V loads are connected, the apparatus manufacturer or line voltage system installer shall consider load balancing to the extent that it is possible.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

Wiring Methods

Fixed wiring systems shall be limited to the following:

- (1) Metallic or nonmetallic liquid tight flexible conduit rated at temperatures not less than 194°F (90°C) with stranded copper wire rated for wet locations and temperatures not less than 194°F (90°C)
- (2) Type SOW, SOOW, SEOW, or SEOOW flexible cord rated at 600 V and at temperatures not less than 194°F (90°C)

Electrical cord or conduit shall 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 and shall be arranged as follows:

- (1) Separated by a minimum distance of 12 in. (300 mm) from exhaust piping or shielded from such piping
- (2) Separated from fuel lines by a minimum distance of 6 in. (150 mm)

A means shall be provided to allow "flexing" between the driving and crew compartment, the body, and other areas or equipment whose movement would stress the wiring.

Electrical cord or conduit shall be supported within 6 in. (150 mm) of any junction box and at a minimum of every 24 in. (600 mm) of run.

Supports shall be made of nonmetallic materials or of corrosion-resistant or corrosion-protected metal. All supports shall be of a design that does not cut or abrade the conduit or cord and shall be mechanically fastened to the apparatus.

Only fittings and components listed for the type of cord or conduit being installed shall be used.

Splices shall be made only in a listed junction box.

Additional Requirements for Flexible Cord Installations

Where flexible cord is used in any location where it could be damaged, it shall be protected by installation in conduit, enclosures, or guards.

Where flexible cord penetrates a metal surface, rubber or plastic grommets or bushings shall be installed.

Wiring Identification

Each line voltage circuit originating from the main panelboard shall be identified.

The wire or circuit identification either shall reference a wiring diagram or wire list or shall indicate the final termination point of the circuit.

Where prewiring for future power sources or devices exists, the un-terminated ends shall be marked with a label showing their wire size and intended function.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

Wiring System Components

Only stranded copper conductors with an insulation rated for temperatures of at least 194°F (90°C) and wet locations shall be used. Conductors in flexible cord shall be sized in accordance with Table 400.5(A) of *NFPA 70*. Conductors used in conduit shall be sized in accordance with 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*. Aluminum or copper-clad aluminum conductors shall not be used.

All boxes shall conform to and be mounted in accordance with Article 314, "Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Manholes," of *NFPA 70*. All boxes shall be accessible using ordinary hand tools. Boxes shall not be permitted behind welded or pop-riveted panels.

The maximum number of conductors permitted in any box shall be in accordance with 314.16, "Number of Conductors in Outlet, Device, and Junction Boxes, and Conduit Bodies," of *NFPA 70*.

All wiring connections and terminations shall provide a positive mechanical and electrical connection. Connectors shall be installed in accordance with the manufacturer's instructions. Wire nuts or insulation displacement and insulation piercing connectors shall not be used.

Each switch shall indicate the position of its contact points (i.e., open or closed) and shall be rated for the continuous operation of the load being controlled. All switches shall be marked with a label indicating the function of the switch. Circuit breakers used as switches shall be "switch rated" (SWD) or better. Switches shall simultaneously open all associated line voltage conductors. Switching of the neutral conductor alone shall not be permitted.

Line voltage circuits controlled by low voltage circuits shall be wired through properly rated relays in listed enclosures that control all non-grounded current-carrying conductors.

Receptacles and Inlet Devices

Wet and Dry Locations

All wet location receptacle outlets and inlet devices, including those on hardwired, remote power distribution boxes, shall be of the grounding type, provided with a wet location cover, and installed in accordance with Section 406.8, "Receptacles in Damp or Wet Locations," of *NFPA 70*.

All receptacles located in a wet location shall be not less than 24 in. (600 mm) from the ground. Receptacles on off road fire apparatus shall be a minimum of 30 in. (750 mm) from the ground. All receptacles located in a dry location shall be of the grounding type and shall be at least 12 in. (300 mm) above the interior floor height. No receptacle shall be installed in a face-up position.

The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical.

Receptacle Label

Each receptacle shall be marked with a label indicating the nominal line voltage (120 volts or 240 volts) and the current rating in amps of the circuit. If the receptacle is DC or other than single phase, that information shall also be marked on the label.

All receptacles and electrical inlet devices shall be listed to UL 498, *Standard for Safety Attachment Plugs and Receptacles*, or other recognized performance standards.

Receptacles used for DC voltages shall be rated for DC service.

ZIONSVILLE FIRE DEPARTMENT

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BUILD SPECIFICATION

Wiring Schematics

An "As-Built" Wiring diagrams for line voltage systems shall be provided to include the following information;

- (a) Pictorial representations of circuit logic for all electrical components and wiring
- (b) Circuit identification
- (c) Connector pin identification
- (d) Zone location of electrical components
- (e) Safety interlocks
- (f) Alternator–battery power distribution circuits
- (g) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems

120/240 VAC SCENE LIGHTING

SIDE UPPER RECESSED SCENE LIGHTS

Six (6) Fire Research Focus, model FCA200-M10, recessed light(s) shall be installed. They shall be equally divided between the curbside and streetside. The housing shall incorporate internal heat-dissipating fins and have cutout dimensions not to exceed 2" deep by 4 1/4" high by 16 1/8" wide. The lamphead shall protrude no more than 1 1/2" from the housing flange. Wiring shall extend from the bottom of the recessed housing.

The lamp head shall have one (1) quartz halogen 1000 watt 120 volt bulb. The bulb shall draw 8.3 amps and generate 22,000 lumens. The bulb shall be accessible through the front. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. Lamphead and housing shall be powder coated white. The floodlight shall be UL listed as a scene light for fire service use.

Scene lights shall be provided with a lens or a means for preventing damage from water spray and shall be listed for wet location usage.

SHOP NOTES

Make: Fire Research

Model: Focus

P/N: FC200-M10

Lights will be equally divided and spaced per body side.

- There shall be two (2) switch(es) to control the above scene lights. The switch(es) shall be located in the cab, within reach of the Driver and/or Officer.

ZIONSVILLE FIRE DEPARTMENT

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BUILD SPECIFICATION

REAR TRIPOD SCENE LIGHTS

Two (2) Fire Research Focus, model FCA600-M10, tripod telescopic light shall be provided. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall extend 40" and rotate 360 degrees. An internal brake shall slow the extension pole during lowering. The outer pole shall be a grooved aluminum extrusion. The folding legs shall be anodized aluminum tubing with plastic endcaps. The fully extended tripod system shall exceed a height of 11'. Wiring shall extend from the pole bottom with a 4' retractile cord.

The lamphead shall have one (1) quartz halogen 1000 watt 120 volt bulb. The bulb shall draw 8.3 amps and generate 22,000 lumens. The bulb shall be accessible through the front. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall incorporate heat-dissipating fins and be no more than 5" deep by 3 3/8" high by 15" wide. Scene lights shall be provided with a lens or a means for preventing damage from water spray and shall be listed for wet location usage.

A weatherproof on-off toggle switch shall be mounted in a switchbox below the lamphead. A wire guard shall be furnished to protect the lamphead glass.

A tripod truck mount bracket set shall be provided for each light. Each set shall include a lower base plate, an upper lock with a quick release spring loaded locking pin, and a shim set.

SHOP NOTES

Make: Fire Research

Model: Focus

P/N: FCA600-M10-ON-6F3

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

COMMAND LIGHT TOWER WITH METAL HALIDE BULB OPTION AND LOWER BANK BACKLIGHT

The apparatus shall be equipped with one (1) all-electric Command Light(s). The unit shall not require tapping into vehicle braking system to be operated, eliminating the chance for vehicle brake problems. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the all-electric light tower specified.

The light bank shall have four (4) weatherproof, 1,500 watt, 240-volt quartz halogen lights and (2) two 1,000 watt metal halide lights. Light heads shall be mounted in three (3) pairs, giving two (2) vertical lines of three (3) when the lights are in the upright position. Power for light bank shall be transmitted through power collecting rings thus allowing 360+ degree continuous rotation in either direction

The lower pair of light heads shall be capable of being rotated about a horizontal axis to provide light down on the vehicle or to the opposite side of the vehicle.

Positioning of the light bank shall be accomplished with maintenance free, heavy-duty 12-volt linear actuators.

The Command Light assembly shall be all aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

Light tower shall be controlled with a hand-held umbilical line remote control. Command Light to be equipped with "Auto-Park" automatic nesting feature.

Command Light controls shall feature:

- Three (3) switches, one (1) for each light bank
- One (1) light bank rotation switch
- One (1) switch for elevating lower stage
- One (1) switch for elevating upper stage
- One (1) light to indicate when light bank is out of roof nest position
- One (1) light to indicate when light bank is rotated to proper nest position

Command Light controls shall be located per itemized compartment list.

The light tower shall have a full extension of 10' - 6" from mounted position and shall extend from nested position to full upright in 20 seconds.

The overall size of the nested light tower shall be approximately 48" wide x 73" long x 15.1/4" high, and weigh approximately 350 lbs.

A flashing warning light signal shall be provided indicating when a light tower is not in nested position as required by NFPA 1901.

The operational envelope of the mast shall be automatically illuminated whenever the mast assembly is being raised, lowered, or rotated as required by NFPA 1901.

The Command Light shall be covered by a One Year limited warranty from defects in materials and workmanship.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

COMMAND LIGHT - KNIGHT TOWER w/ BACKLIGHT

The apparatus shall be equipped with one (1) all-electric floodlight tower(s). The unit shall not require tapping into vehicle braking system to be operated, eliminating the chance for vehicle brake problems. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the all-electric light tower specified. NO EXCEPTIONS.

The light tower shall have six (6) weatherproof, 500 watt, 120 volt quartz halogen lights. Light heads shall be mounted in three (3) pairs, giving two (2) vertical lines of three (3) when the lights are in the upright position. The light tower shall have slip-rings for a full 360 degree rotation and capable of rotating either direction from a stowed position, NO EXCEPTIONS.

The lower pair of light heads shall be capable of being rotated about a horizontal axis to provide light down on the vehicle or to the opposite side of the vehicle.

The light tower shall be capable of overhanging the side or back of the vehicle (depending on mounting location) to provide maximum illumination and a warming area adjacent to the vehicle, NO EXCEPTIONS. Positioning of the light bank shall be accomplished with maintenance free, heavy duty 12 volt linear actuators. The light tower shall be all aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

Light tower shall be controlled with a hand-held umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature.

Command Light controls shall include:

- Three (3) switches, one (1) for each light bank.
- One (1) light bank rotation switch.
- One (1) switch for elevating lower stage.
- One (1) switch for elevating upper stage.
- One (1) light to indicate when light bank is out of roof nest position.
- One (1) light to indicate when light bank is rotated to proper nest position.
- One (1) back light rotation switch
- One (1) "On/Off" switch for the top mounted strobe (optional)

The controls shall be located per the itemized compartment list.

The light tower shall have a full extension over 7' from mounted position and extend from nest position to full upright in 15 seconds. The overall size of nested light tower shall be approximately 23" wide x 47" long x 11 3/4" high, and weight approximately 120 lbs.

A flashing warning light shall be provided in cab, indicating when a light tower is not in nested position as required by NFPA 1901. The operational envelope of the mast shall be automatically illuminated whenever the mast assembly is being raised, lowered, or rotated as required by NFPA 1901.

The Command Light shall be covered by a one (1) year limited warranty from defects in materials and workmanship. An operation, maintenance, and parts manual shall be provided with the delivered apparatus.

The specified light tower(s) shall be recessed into the roof of the apparatus body so that no part of the light tower extends above the roof line. The recessed area shall have two (2) water drain holes (in opposite corners) with flexible 1" diameter hose routed to the area below the body.

SHOP NOTES

Both light towers will be recessed.

ZIONSVILLE FIRE DEPARTMENT

SVI # 744

BUILD SPECIFICATION

EQUIPMENT

The following equipment shall be furnished with the completed Special Service vehicle;

- There shall be six (6) removable UPF brand plastic tool box(s) with hand holes for carrying. The exact size and location of the of the tool boxes will be determined at the pre-construction meeting.

SHOP NOTES

Wait to order plastic tool bins until tool mounting - we can drop ship to FD after shipment of truck if needed - FD wants to place all equipment before knowing what dimensions are going to required

- One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.
- One (1) Alco-Lite PEL 28' aluminum 2-section extension ladder(s) shall be provided with the completed unit.
 - The ladder(s) shall be mounted on upper side wall of walkway.
- One (1) Alco-Lite PRL-16 16' aluminum roof ladder(s) shall be provided with the completed unit.
 - The ladder(s) shall be mounted on upper side wall of walkway.
- Five (5) FlareAlert LED illuminated warning devices shall be supplied with completed unit.
 - The above specified illuminated warning devices(s) shall be mounted on the completed unit, locations as per the ZIONSVILLE FIRE DEPARTMENT.

FIRE DEPARTMENT TOOL MOUNTING

SVI shall install FD supplied equipment per the list supplied at the pre construction meeting.

It will be the responsibility of the FD to locate each piece of equipment at a tool mounting meeting at SVI before the final inspection.