

# Harrisburg Fire Department

## INTERNET IN-PROCESS SITE

The Bidder shall post and maintain a website where the Harrisburg 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.

## CONSTRUCTION DOCUMENTATION

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

1. The manufacturers record of apparatus construction details, including the following information:
  - a. Owners name and address
  - b. Apparatus manufacturer, model, and serial number
  - c. Chassis make, model, and serial number
  - d. GAWR of front and rear axles
  - e. Front tire size and total rated capacity in pounds (kg)
  - f. Rear tire size and total rated capacity in pounds (kg)
  - g. Chassis weight distribution in pounds with water and manufacturer mounted equipment (front and rear)
  - h. Engine make, model, serial number, rated horsepower and related speed, and governed speed
  - i. Type of fuel and fuel tank capacity
  - j. Electrical system voltage and alternator output in amps
  - k. Battery make, model, and capacity in cold cranking amps (CCA)
  - l. Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
  - m. Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - n. Pump transmission make, model, serial number, and gear ratio
  - o. Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - p. Water tank certified capacity in gallons or liters
  - q. Paint manufacturer and paint number(s)
  - r. Company name and signature of responsible company representative
2. Certification of slip resistance of all stepping, standing, and walking surfaces
3. If the apparatus has a fire pump, a copy of the following shall be provided: pump manufacturers certification of suction capability, apparatus manufacturers approval for stationary pumping applications, engine manufacturers certified brake horsepower curve showing the maximum governed speed, pump manufacturers certification of the hydrostatic test, and the certification of inspection and test for the fire pump
4. If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source
5. If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation
6. 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)
7. Written load analysis and results of the electrical system performance tests
8. When the apparatus is equipped with a water tank, the certification of water tank capacity

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## **OPERATION AND SERVICE DOCUMENTATION**

The contractor shall supply, at time of delivery, at least two 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 apparatus and all major components thereof.

The contractor shall also provide documentation of the following items for the entire apparatus and each major operating system or major component of the apparatus:

1. Manufacturers name and address
2. Country of manufacture
3. Source of service and technical information
4. Parts and replacement information
5. Descriptions, specifications, and ratings of the chassis, and pump
6. Wiring diagrams for low voltage and line voltage systems to include the following information: representations of circuit logic for all electrical components and wiring, circuit identification, connector pin identification, zone location of electrical components, safety interlocks, alternator-battery power distribution circuits, and 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 any auxiliary systems
9. Instructions regarding the frequency and procedure for recommended maintenance
10. Overall apparatus operating instructions
11. Safety considerations
12. Limitations of use
13. Inspection procedures
14. Recommended service procedures
15. Troubleshooting guide
16. Apparatus body, chassis, and other component manufacturers warranties
17. Special data required by this standard
18. Copies of required manufacturer test data or reports, manufacturer certifications, and independent third-party certifications of test results
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.

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## **NFPA REQUIRED MANUALS**

The construction, operation, and service documentation shall be provided on a CD-ROM. These manuals shall be written in a "step by step" format for ease of reference. There shall be two (2) copies of the CD provided with the apparatus as standard.

- There shall be two (2) printed copies of the manual provided with the apparatus.

## **CONSTRUCTION PERIOD**

The Bidder shall specify the number of days after award of the contract and after receipt of cab/chassis in which the apparatus will be completed. The maximum period for construction shall be three hundred sixty five (365) days after receipt of Purchase Order.

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

## **WARRANTY**

The Bidder shall provide a full statement of the warranty provided for the vehicle(s) being bid. This warranty should clearly describe the terms under which the vehicle's Manufacturer accepts responsibility for the cost to repair defects caused by faulty design, quality of work or material, and for the applicable period of time after delivery.

Cost of repairs refers to all costs related thereto including, but not limited to, the cost of materials, the cost of labor.

The Manufacturer shall warrant all materials and accessories used in the vehicle(s), whether fabricated by the Manufacturer or purchased from an outside source and will deal directly with the Harrisburg Fire Department on all warranty work.

The warranty shall commence upon acceptance of the vehicle.

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## **GENERAL WARRANTY - ONE (1) YEAR**

The entire body and all SVI installed components shall be warranted, including parts and labor for a period of at least **One (1) Year** commencing upon the placing of the unit in-service by the Harrisburg Fire Department (except that warranty on the tires and tubes, batteries, electrical lamps, and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for same are to be made directly with the manufacturer). Extended warranties on the engine, transmission, or other major components shall be detailed by Bidder in proposal.

This warranty shall not apply to those items which are usually considered normal maintenance and repair; including but not limited to normal lubrication or proper adjustment of main functional operating components. All manufacturers' warranties (apparatus & equipment) shall be furnished and indicated in the manufacturer's bid. Any standard warranties, including, but not limited to engine, transmission, tires and axles furnished by the original equipment manufacturer (OEM) or the prime contractor will be passed on to the Harrisburg Fire Department. Also include any available extended warranties that will start after the initial warranty period. Goods or property shall be as represented by these specifications as well as additional agreements as a result of discussions regarding these specifications and shall be as promised with implied liability on the manufacturer.

The Body Manufacturer must be the "single source" coordinator of all warranties on the vehicle.

## **STRUCTURAL WARRANTY - TEN (10) YEARS**

The Manufacturer shall warrant that each new rescue body (exclusive of paint, finish, hardware, moldings, windows, and other appointments and accessories) is structurally sound and free of all structural defects of both material and workmanship and further warrants that it will maintain such structural integrity for a period of **ten (10) years** from the completion date listed on the Manufacturer's data plate attached to the vehicle inside the cab.

The Manufacturer further warrants that this structural integrity warranty may be transferred to a second Purchaser providing the vehicle is inspected by the Original Manufacturer or their authorized representative within thirty (30) days of ownership transfer. To maintain warranty coverage, the proper ownership transfer papers shall be kept on file at Manufacturer's facility.

In the event of a chassis remount, this structural warranty shall remain in effect providing that the re-chassis work is completed by the Manufacturer or a facility which obtains written authorization from the Manufacturer.

Should repairs become necessary under the terms of this warranty, the extent of the repair shall be determined solely by the Manufacturer and shall be repaired by the Manufacturer or an Authorized Service Center designated by the Manufacturer. The expense of any transportation to or from the ASC shall be the responsibility of the Harrisburg Fire Department and is not an item covered by this warranty.

There shall be a Warranty Certificate supplied with the completed apparatus to detail the warranty configuration.

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## **TESTING**

### **12 VOLT DC - NFPA TEST**

The apparatus low voltage electrical system shall be tested and certified by the manufacturer per NFPA 1901. The test shall be performed with the air temperature between 0 degrees F and 110 degrees F.

### **TEST SEQUENCE**

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

### **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 loads shall be activated for ten (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.

### **ALTERNATOR PERFORMANCE TESTS:**

#### **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 two (2) hours. Activation of the load management system shall be permitted during the test. However, an alarm sounded by excessive battery discharge, as detected by the system required to notify apparatus personnel of electrical system failure, or a system voltage of less than 11.7 volts DC for a 12 volt nominal system for more than 120 seconds, shall be considered a test failure.

#### **LOW VOLTAGE ALARM TEST**

Following completion of the above tests, the engine shall be 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. With the load still applied, a reading of less than 11.7 volts DC for a 12 volt nominal system shall be considered a test failure.

The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered test failure.

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## **DOCUMENTATION**

Documentation of the electrical system performance test shall be provided with delivered apparatus. In addition a written load analysis, including the following;

- Nameplate rating of alternator.
- Alternator rating under the conditions specified in NFPA 1901.
- Each component load specified in NFPA 1901, comprising the minimum continuous load.
- Additional loads that when added to the minimum continuous load determine the total connected load.
- Each individual intermittent load.

## **120/240 VOLT AC NFPA TEST - BY UNDERWRITERS LABORATORIES**

The apparatus 120/240 volt electrical system shall be tested and certified Underwriters Laboratories. The certification shall be delivered to the customer with the apparatus.

The test shall be performed with the air temperature between 0 degrees F and 110 degrees F.

## **TEST SEQUENCE**

The following test shall be performed in the order indicated below.

The wiring and permanently connected devices (excluding utilization devices) are subjected to 900 VAC for one (1) minute. The test is conducted between live parts and the neutral conductor, as well as between the live parts and the vehicle frame with any switches in the circuit closed. The test is accomplished with a Biddle HiPot tester model 230315.

The generator output is tested at 100% of its nameplate rating for a minimum of two (2) hours, into a resistive load. The following information is recorded of the generator and its power supply at 30 minute intervals during the test: voltage, amperage and frequency output of the generator, as well as the oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery charge rate, as applicable.

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## **INSPECTION TRIPS**

The Bidder shall provide nine (9) individual inspection trip(s) to the factory. The quantity of people and number of trips can be configured to meet the needs of the Harrisburg Fire Department. The cost of transportation, food, and lodging shall be borne by the Bidder.

If the Harrisburg Fire Department is more than 250 miles from factory than the transportation shall be by commercial airline.

The description of these factory trips must be included in Bid. If nothing is described or mentioned in the Bid pertaining to inspection trips, then it is assumed that the Bidder is taking exception to inspection trips required, and bid shall be rejected.

## **DELIVERY AND DEMONSTRATION**

The contractor shall be responsible for the delivery of the completed unit to the Harrisburg Fire Departments 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 Harrisburg Fire Department regarding the operation, care, and maintenance of the apparatus and equipment supplied at the Harrisburg Fire Departments location.

The delivery engineer shall set delivery and instruction schedule with the person appointed by Harrisburg Fire Department.

After delivery of the apparatus, the Harrisburg 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*.

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## **CAB AND CHASSIS**

The cab and chassis shall be a Spartan Chassis, Inc. Flat Floor Gladiator, model GA41J, long two door, 10" raised roof over crew and driver-officer area, aluminum tilt cab, built specifically for the fire service by a publicly held U.S. parent company, specializing in chassis design for all fire service applications. The cab and chassis shall meet the requirements of the National Fire Protection Association Standard 1901, (2003 edition or latest edition).

Since the Spartan cab/chassis is available to all manufacturer's there will be No Exceptions to the Spartan make and model specified.

## **FLAT FLOOR LTD 10" RAISED ROOF 2DR TILT CAB**

The cab shall be a Spartan Chassis, Inc. Flat Floor, LTD (long two door), 10" raised roof, tilt aluminum cab, capable of seating two (2) firefighters.

The cab shall be of the Eurospace interior design allowing for easy communication inside the cab. The cab overall length shall be 109.38" with 33.00" from the centerline of the front axle to the back of the cab.

The rear cab wall shall be .090" thick aluminum.

The cab front skin and floor shall be .190" thick aluminum. The inside width shall be 90.00" and the front floor to headliner shall be 68.00" high.

All glass used in the cab shall be automotive tint. The windshield shall have a maximum of 2890 sq.in. area and be of the wraparound design 52.88" wide and 27.88" height for maximum visibility. Left and right windshield shall use the same interchangeable glass.

A molded rubber 11" grab handle shall be provided on the hinge post inside the cab at both the driver and officer door for entering and exiting the cab.

The driver and officer seats shall have an 8.25" high x 12.69" wide x 15.13" deep compartment in the seat box beneath them. The compartment shall have a hinged door with an opening of 6.00" high x 14.25" wide.

Intermittent electric wipers with a single motor and electric powered "wet arm" type windshield washers shall be provided. Access to the wiper motor shall be through the driver's side headlamp module located on the front cab fascia.



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## **CAB DOORS**

The cab doors shall be flush, "barrier clear" style, short doors with hidden .375 stainless steel door hinges. All doors shall be equipped with exterior pull handles, suitable for use with firefighter mittens, and keyed alike locks that are designed to prevent accidental lockout.

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

The front doors shall measure 43.00" x 69.00" with .13" thick aluminum skins. The front steps shall be a two (2) step configuration with the lower step constructed of an open grate material and the intermediate step shall be covered with embossed, NFPA compliant aluminum tread plate.

The following measurements shall apply:

First step: 11.44" deep x 31.13" wide

Intermediate step: 8.75" deep x 33.00" wide

Ground to first step: approximately 21.00"

First step to intermediate step: 11.00"

Intermediate step to floor: 11.00"

A rear pocket step shall be installed in the side of the cab behind the wheel well, one each side to assist in getting items from the transverse compartment.

## **DOOR HANDLES EXTERIOR - CHROME**

The cab door exterior pull handles (2) shall be extruded aluminum with a polished chrome plated finish.

Each handle shall include an aluminum scuff plate with a polished chrome finish. The scuff plate shall be 6.25" tall x 10.50" wide.

## **FRONT ROLL DOWN DOOR WINDOWS**

The front doors shall have a full roll down window 27.00" x 26.00" with a total glass area of 702 square inch each.

## **FABRIC COVERED SEATS - DURABLE BALLISTIC POLYESTER**

The seats shall be covered with a high strength, wear resistant fabric of durable ballistic polyester. A PVC coating is bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids.

## **GRAY SEAT COLOR**

All seats supplied on the chassis shall be gray in color.

## **SEATBELT WARNING SYSTEM**

A seatbelt use warning system shall be installed in the chassis. The system will provide a visual and audible warning when all of the following conditions are met.

- 1.) Any seat is occupied (sixty pounds minimum).
- 2.) The corresponding seat belt(s) remains unfastened.
- 3.) The park brake is released.

Once activated, the visual and audible indicators will remain active until all occupied seats have the seat belts fastened.

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## **DRIVER SEAT**

The driver's seat shall be a two-way manual adjustment Seats Inc. 911 "Universal" high back seat and shall include a tapered and padded seat cushion and back, with a minimum of 37" from the seat H-point to the headliner.

The seat shall be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The female seat belt clasp shall extend up from the seat base ~ 14" to be within easy reach of the occupant. The ABTS feature is an engineering break through where the passenger restraint harness is built into the seat module and meets the twenty "G" load test.

## **OFFICER SEAT**

The officer's seat shall be a Seats Inc. 911 "Universal" SCBA high back seat and shall include a tapered and padded seat cushion and back.

The seat back shall include a vertically split hinged headrest and ZICO "ULL" bracket with LLS strap. A removable padded cover shall be supplied over the SCBA cavity.

The seat shall be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The female seat belt clasp shall extend up from the seat base ~ 14" to be within easy reach of the occupant. The ABTS feature is an engineering break through where the passenger restraint harness is built into the seat module and meets the twenty "G" load test.

## **CLASSIC FRONT FASCIA**

The front cab fascia shall be constructed of aluminum, which will attach to the front cab skin and act as a fascia only.

The front fascia will cover the front aluminum cab structure from the bottom of the windshield down to the bottom of the cab. The front cab fascia shall have provisions for four (Hi/Low Beam) headlamps, turn signal lamps and up to four warning lamps.

The front fascia shall allow access to check and fill the engine oil and wiper washer fluid. Access is also provided for servicing the windshield wiper motor and linkage, ember separator, headlamps, electrical bulkhead connectors, transmission ECU and the multiplex V-Mux control.

## **WARNING LIGHTS -INBOARD**

Two (2) Whelen 4x6 LED CLEAR warning lights shall be installed on the cab fascia above the headlamps in the inboard position.

## **HEADLIGHTS**

Four (4) rectangular halogen headlamps with a separate high and low beams in bright bezels shall be provided. The headlamps shall be equipped with a "Daytime Running" light feature, which will illuminate the headlights to 80% brilliance when the master switch is in the "On" position and the parking brake is released.

Two (2) round side turn signal/marker lights shall be provided on the front cab corners.

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## **WARNING LIGHTS- OUTBOARD**

Two (2) Whelen 4x6 LED red warning lights shall be installed on the cab fascia above the headlamps in the outboard position.

## **TURN SIGNALS - AMBER LED**

Two (2) Whelen 4x6 amber LED programmable arrow turn signals shall be installed in polished aluminum castings above the outer warning lamps.

## **WARNING LIGHT**

A Roto Ray model 200 warning light shall be installed on the front of the cab on the center section of the 3-piece upper grille. The light shall have three (3) sealed beam lights (two (2) red / one (1) clear) and rotate at 200 rpm in the vertical plane.

## **FRONT GRILLE 3-PIECE RAISED - GLADIATOR/DIAMOND CLASSIC**

A three (3) piece, hinged stainless steel raised front grille shall be installed on the front of the cab. The upper center portion of the grille will be fixed and the upper outer sections will be hinged and will have two (2) flush push button latches that allow access to the front fluid fills of the cab.

## **CAB MIRRORS**

Two (2) Retrac West Coast style mirrors model 1178 shall be provided. The mirrors shall be Dual Vision, motorized and non-heated with 7" x 16" mirror and a convex in the lower portion of the mirror head. The mirror heads shall be mounted on stainless steel bow swing away type arms mounted to the cab doors. The mirror head backs are mold injected black vacuum formed ABS composite.

## **CAB CRASH TEST ECE-29**

Spartan Chassis, Inc. has successfully submitted their extruded flat floor cab to the International crash test ECE-29, Addendum 28, revision 1. 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 lb.ft. of force to the cab front face. The cab must be so constructed that after the test, there will be minimal intrusion of cab structure into the passenger area. Note: After the test the Spartan cab doors remained usable for both entry or exit. Also, as part of the test the cab roof must withstand a static load bearing test. The Spartan cab withstood a weight of over 60,000 pounds without permanent damage or collapse. The above tests were witnessed by and attested to by an independent third party. The test results were recorded on/by cameras, high speed imagers, accelerometers and strain gauges. Notarized copies of the letters verifying the test results and videos of said test are available upon request.

## **ONE YEAR CHASSIS WARRANTY**

The chassis manufacturer shall warrant to the original purchaser the custom fire truck chassis for a period of twelve (12) months with the exception of the actual fire apparatus chassis frame which carries a lifetime warranty. The warranty period shall begin on the date the vehicle is delivered to the original purchaser. The warranty may include conditional items, which shall be listed in the detailed warranty document that shall be provided upon request.

## **CAB WARRANTY**

The cab 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.

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## **PAINT FRAME AND CHASSIS UNDER CARRIAGE**

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 cab color. Paint shall be applied before airlines and electrical wiring is installed.

## **CHASSIS WHEELBASE**

The chassis wheelbase shall be 197.5".

Actual wheelbase will be 197.5"

CA shall be 164".

AE = 99".

## **FRAME**

The frame side rails shall be black powder coated "C" channel type 10.25" x 3.5" x .38" with an inner channel 9.44" x 3.13" x .38" of 110,000 psi minimum yield high strength steel, a RBM of 3,315,214 inch pounds and a section modulus of 30.14 cubic inches.

A minimum of seven (7) fully gusseted bolted assembly crossmembers shall be installed using grade 8 flanged head bolts and flanged lock nuts.

The area between the axle suspension hangers shall be free of any holes or fasteners in the flanges. No welding shall be incorporated in attachment of components. All frame dimensional cutting shall be by a plasma cutter. All relief areas shall be cut in with a minimum 2" radius at intersection points with ground smooth edges to prevent a stress focal point.

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

## **OVERALL HEIGHT**

The height of the vehicle shall not exceed 140" from the ground.

## **FUEL TANK**

The fuel tank shall have a minimum capacity of fifty (50) gallons. The baffled tank shall be made of 14 gauge aluminized steel. The tank exterior is painted with a primer and top coat. This results in a tank which offers the internal and external corrosion resistance and surface characteristics of aluminum with the strength, durability and economy of steel.

The fuel tank shall be mounted under the frame, behind the rear axle with a three-piece strap hanger assembly with a "U" strap bolted midway on the fuel tank front and rear so the tank can be easily lowered and removed for service purposes. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

The tank shall have a vent port to facilitate rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2"NPT fill ports for right or left hand fill. A .5"NPT drain plug shall be centered in the bottom of the tank.

The standard fuel line for ISC and ISL engines will be nylon material rated for diesel fuel. All other engines will be steel wire braid reinforced rubber.

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## **FRONT BUMPER SEVERE DUTY STYLE**

A one-piece, structural channel style, painted steel front bumper shall be provided. The material shall be .387 thick structural steel channel 12" high and 101" wide, with angled front corners.

The bumper shall be extended 24" ahead of the cab.

Color of Front Bumper:

## **AIR HORNS**

Dual Grover Stuttertone 24" air horns shall be recessed in the front bumper, one (1) each on the driver and officer between chassis frame rails. A 3/8" airline "teed" equal distance from each horn shall be installed.

## **ADDITIONAL AIR RESERVOIR**

An additional 1200 cubic inch air reservoir shall be installed and isolated to prevent depletion of the air to the air brake system and to act as a supply tank for operating air equipment. It shall be plumbed with a 90 psi pressure protection valve on the reservoir supply side.

## **INTERSECTOR LIGHTS**

Two (2) Whelen 4x6 LED red warning lights shall be installed, one on each bumper tail to act as intersector lights.

## **FRONT BUMPER APRON**

The front bumper apron if required shall be installed by the apparatus manufacturer.

## **TOW HOOKS**

Two (2) heavy duty chrome plated tow hooks shall be installed under the bumper and bolted directly to the chassis frame with grade "8" bolts.

## **AIR HORN ACTUATION**

Air horns actuation shall be accomplished by a dual lanyard cable, one each side of AC plenum.

## **SPEAKERS CPI**

Two (2) Cast Products Inc. bright aluminum 100 watt speakers shall be recessed in the front bumper one each inboard on the driver's and officer's side.

The speakers shall be bolted to bumper by means of a polished aluminum trim ring on the front face of the bumper.

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## **FRONT AXLE**

The front axle shall be an ArvinMeritor MFS-20 with a 3.74" drop and a 71.00" KPI.

It shall have a capacity of 20,000 pounds GAWR.

## **Suspension**

The springs shall be a taper type, three (3) leaf, 54" long and 4" wide with a Berlin wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counterbore and lubrication land off crossbore with grease fitting. The spring capacity shall meet or exceed the capacity of the front axle.

## **Steering**

The hydraulic power assist steering gear shall be a TRW TAS-65 with a hydraulic power assist cylinder. The steering ratio shall be 20.4:1 and have 5.4 turns stop to stop.

## **FRONT TIRES**

The front tires shall be Michelin 385/65R 22.5 18PR "J" tubeless radial XTE2 highway tread with 22.5 x 12.25, ten (10) stud disc wheels. The tires and wheels shall be rated at 20,000 pounds.

## **FRONT AXLE CRAMP ANGLE**

The hub piloted, MFS-20 front axle cramp angle shall turn 48 degrees to the left and a minimum of 44 degrees turning to the right, when using the 385/65R 22.5 front tires.

## **FRONT WHEELS ALUMINUM**

The front wheels shall be Accuride hub piloted, 12.25" x 22.5" polished aluminum wheels.

## **FRONT WHEEL BEARINGS OIL LUBRICATED**

The front axle wheel bearings shall be oil lubricated and come equipped with an oil level visual inspection window.

## **FRONT SHOCK ABSORBERS**

Two (2) Bilstein monotubular design, nitrogen gas charged shock absorbers shall be part of the front axle suspension. Bilstein shall warranty the shock for a period of five (5) years.

## **FRONT BRAKES**

The front brakes shall be ArvinMeritor 16.5" x 6" S-cam type with ArvinMeritor automatic slack adjusters.

## **CHASSIS ALIGNMENT**

The chassis frame rails shall be cross checked for length and squareness. Front and rear axles shall be laser aligned. Tires and wheels shall be aligned and toe-in set on the front tires at the chassis manufacturer's facility.

The completed apparatus should be rechecked for proper alignment after the chassis has been fully loaded.

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## **STEERING COLUMN AND WHEEL**

The Douglas Autotech steering column shall be a seven (7) position tilt and 2.25" telescopic type with an 18" steering wheel. 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.

## **REAR AXLE**

The rear axle shall be an ArvinMeritor model #RS-25-160 with single reduction gearing and shall have a fire service rated capacity of 27,000 pounds GAWR.

## **TOP SPEED**

The top speed of the vehicle shall be approximately 75 MPH +/-2 MPH at governed engine RPM.

## **REAR DISC BRAKES**

The single rear axles with a maximum rating up to 27,000 pounds GAWR, shall have Meritor EX225 Disc Plus disc brakes with 17" vented rotors and automatic slack adjusters.

## **ABS BRAKE SYSTEM**

A Meritor Wabco four sensor four modulator anti-lock braking system shall be installed on the front and rear ArvinMeritor axles for safer vehicle control during braking and reduced stopping distance in skid conditions.

The electronic monitoring system shall incorporate diagonal circuitry to 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. A momentary test switch shall be installed to test the system for diagnostic codes.

The ABS system shall automatically disengage the auxiliary braking system device when required.

The Meritor Wabco ABS system shall have a three (3) year or 300,000 mile warranty provided by Meritor Wabco Vehicle Control Systems.

## **REAR TIRES**

The rear tires shall be Michelin 12R 22.5 16PR "H" tubeless radial XDN2 all-weather tread with 22.5 x 8.25, ten (10) stud disc wheels. Tires and wheels shall be rated at 27,120 pounds.

## **REAR WHEELS ALUMINUM**

The single rear axle wheels shall be Accuride hub piloted, 8.25" x 22.5" polished aluminum wheels.

## **OIL LUBRICATED REAR WHEEL BEARINGS**

The rear axle shall have oil lubricated wheel bearings.

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## **REAR SUSPENSION**

The rear suspension shall be a Reyco 79KB vari-rate, captive slipper type, with 57.5" x 3" springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The spring capacity must meet or exceed the capacity of the rear axle.

## **AIR BRAKE SYSTEM - SINGLE AXLE**

A rapid build-up air brake system shall be provided. It shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity.

A Meritor-Wabco floor mounted treadle valve shall be mounted in the cab for graduated control of applying and releasing brakes.

A Meritor-Wabco inversion valve shall be installed to provide a service brake application with no primary air supply.

A Meritor-Wabco yellow hand control push-pull valve shall operate the parking brake system.

The rear axle spring brakes are to automatically apply in case of air pressure loss below 60 psi with a mechanical means for releasing the spring brake chambers.

## **PARKING BRAKE ACTUATION VALVE**

The parking brake actuation valve shall be mounted on the LH dash within easy reach of the driver.

## **AXLE COVER KIT STAINLESS STEEL (ALL WHEELS)**

The front and rear wheels shall have stainless steel lug nut covers. The front axles shall be covered with stainless steel baby moons with hole to view oil seal window. The rear axles shall be covered with foam mounted stainless steel high hats.

The lug nut covers, baby moons and high hats shall be American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel meeting D.O.T. certification standards. All stainless steel baby moons and high hats shall carry a lifetime warranty.

## **VOGEL LUBRICATION SYSTEM**

A Vogel Lubrication system shall be installed on the chassis. The system shall be capable of lubricating 24 grease points on the chassis. A park brake interlock is incorporated into the ignition system to keep the system from operating while parked.

## **TIRE CHAINS**

Insta-Chains, automatic ice chains shall be installed on the rear axle of the chassis to provide instant traction on ice and snow at speeds below 35 mph. The system shall include a switch on the dash with a lift-up cover to prevent accidental activation.



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## **AIR DRYER**

A Meritor Wabco system saver 1200 spin-on desiccant air dryer with a 12-volt, 100-watt automatic heated moisture ejector shall be installed in the air brake system.

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 Meritor Wabco air dryer shall come with a three (3) year or 300,000 mile warranty provided by Meritor Wabco Vehicle Control Systems.

## **MANUAL DRAINS ON AIR TANKS**

Manual drains shall be installed on all reservoirs of the air brake system.

## **NYLON AIR LINE TUBING**

A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed. 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 be fiber reinforced neoprene covered hoses.

## **ENGINE**

A Detroit Diesel Series 60 14.0 liter, turbocharged, charge air cooled engine shall be provided.

### TYPE:

In-Line six (6) cylinder, 4 cycle

### HORSEPOWER:

515 @ 1800 rpm

### TORQUE:

1650 lb.ft. @ 1200 rpm

### DISPLACEMENT:

858 cu.in.

### GOVERNOR:

DDEC Electronic

A wiring harness with connectors extending to the pump panel area with circuits provided for a hand throttle, Fire Commander, multiplexed gauges and high idle actuation (as optionally required for this apparatus) shall be provided.

A primary full flow, and secondary full flow, spin-on oil filter shall be installed as part of the engine's lubrication system.

## **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.

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## **AIR COMPRESSOR**

The air compressor on the engine shall be a Bendix BA-921 rated as being capable of producing a minimum of 15.8 cfm. It shall be gear driven, engine oil pressure lubricated and cooled by the engine cooling system.

Engine Detroit Ser60 EPQ 2004-GLAD

## **ENGINE WARRANTY**

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

## **FUEL FILTERS - DETROIT DIESEL ENGINE**

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

## **JACOBS ENGINE BRAKE - DETROIT SER 60**

A Jacobs engine compression brake, for the six (6) cylinder Detroit Series 60 engine, with brake light actuation and cutout relay when in pump mode shall be installed. The engine brake will activate upon release of accelerator when in operation mode. A dash mounted switch with "On/Off" and High/Med/Low functions shall be installed.

## **EXHAUST SYSTEM**

The exhaust system shall be installed under the frame with the discharge to the right side forward of the rear tires.

A muffler and .065 wall aluminized steel exhaust tubing supported by bolted on frame brackets shall be installed.

Stainless steel flex tubing is to be installed between exhaust pipe and muffler. System joints shall be connected with lapping band clamps.

## **COOLING SYSTEM**

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

### Radiator

The radiator shall be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator shall have a minimum of a 800 sq. in. core and 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.

### Surge Tank

The cooling system shall be equipped with a surge tank that is capable of being filled and 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 manufactures pressure requirements as well as the system design requirements.

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## Coolant

The cooling package shall have Extended Life Coolant (ELC) installed. The use of supplemental coolant additives (SCA) will not be allowed, as this is part of the extended life coolant makeup. The use of ELC provides longer life and change intervals providing improved performance. The coolant shall contain ethylene glycol and deionized water to keep the coolant from freezing to a temperature of -34 degrees F.

## Hoses/Clamps

All radiator tubes shall be formed from aluminized steel tubing and installed with silicone hoses with stainless steel constant torque clamps.

## Recirculation Shields

Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting the performance.

## Charge Air Cooler

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 487 sq. in. 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.

## Hoses/Clamps

All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "T" style clamps meeting the engine manufactures requirements.

## **COOLING SYSTEM FAN**

The engine cooling system shall incorporate a thermostatically controlled, Horton clutched fan.

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy.

The fan will automatically lock up when the vehicle is placed in pumping mode.

The fan shall be installed on the engine and includes a shroud. Recirculation shields shall be installed to insure that air, which has passed through the radiator, is not drawn through it again.

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## **TRANSMISSION**

The transmission shall be an Allison 4000 EVS automatic with electronic controls. The transmission will have two (2) 10-bolt PTO pads.

The transmission shall be equipped with an air to oil transmission cooler located below the radiator allowing a single depth core and efficient cooling package. The transmission cooler shall be mounted in a manner to allow maximum approach angle by not protruding below the frame more than an inch. The transmission cooler shall be constructed completely of aluminum with welded side tanks. The transmission shall have two (2) internal oil filters.

Fourth gear hold-in range may be accomplished through wiring for a pumping application.

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

## **TRANSMISSION COOLING SYSTEM**

### Transmission Cooler

The transmission cooler shall be a cross flow air to oil design constructed completely of aluminum with welded side tanks. The transmission cooler shall be bolted to the bottom of the radiator to allow a single depth core, allowing a more efficient and serviceable cooling system. The transmission cooler shall be mounted in such a manner as not to extend below the chassis frame by more than 1", allowing greater approach angles and ground clearance.

### Transmission Heat Exchanger

The transmission oil to water heat exchanger shall be installed to aid in cold climate conditions maintaining the transmission temperature at the operational level.

## **SYNTHETIC TRANSMISSION FLUID**

Castrol "Transynd" or an equivalent synthetic TES 295 transmission fluid shall be utilized to fill the 4000 EVS transmission.

## **TRANSMISSION MODE**

The transmission, upon start-up, will select five (5) speed operation without the need to press the mode button.

## **TRANSMISSION WARRANTY**

The Allison 4000 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.

The transmission must be filled with transynd synthetic fluid or approved equal.

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## **ALTERNATOR**

A 320 amp Leece Neville 12 volt alternator model #4962PA with internal regulator and #10 screw AC terminals shall be installed.

## **ENGINE OIL LEVEL CHECK**

A low engine oil level switch shall be provided that will indicate when the engine oil is approximately four (4) quarts or more low. The switch shall light a red "LOW OIL LEVEL" indicator light in the dash. The indicator shall only function while the ignition switch is on and the engine is not running.

## **AIR CLEANER**

The air cleaner shall be Farr #62891-001 dry type with a replaceable element, it shall have an outside air intake with an ember separator filter and an indicator light in the warning light cluster to show when the air cleaner element requires replacement.

## **STOP, TAIL, TURN AND BACK-UP LIGHT WIRING**

Individual wires shall be run to the rear of the chassis for the stop light, turn signal, tail light and back-up lights.

## **TRANSMISSION TOUCH PAD**

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and reach.

## **DRIVELINES**

All drivelines shall be Spicer 1710 heavy duty series with "glide coat" splines on all slip shafts.

## **POWER TAKE OFF (PTO)**

A ten (10) bolt Chelsea model 277 heavy duty engine 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 controls shall be accomplished through the Allison transmission controls. The transmission shall be capable of control such features as minimum and maximum engine speed for engagement, maximum engine speed for operation, minimum and maximum output speed for engagement and maximum output speed for operation.

Model part number shall be 277X\_\_\_\_FJPB5\_\_\_\_.  
4000EVS - Chelsea 277XGFJPB5XD 147% Ratio

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## MULTIPLEX ELECTRICAL SYSTEM WITH COLOR DISPLAY

A Weldon multiplex electrical system shall be supplied. The system shall be a single starting type, installed per NFPA 1901. The electrical system shall be 12 volt, suppressed per SAE J551 with six (6) Harris CTX31S-9 950 CCA batteries with 210 minute reserve capacity and 3/0 welding type dual path starter cables per SAE J541.

The Multiplexed wiring system shall include the following:

- \* Dash or engine tunnel mounted information center with approximately 4"H (92mm) x approximately 6"W (159mm) color LCD screen.
- \* Systems Diagnostic Menu and controls.
- \* Solid state switching.
- \* Complete Peer to Peer network architecture.
- \* Weatherproof Nodes and sealed Deutsch connectors.
- \* Sequences and sheds electrical loads.

The Vista III Display Node shall include the following features:

- \* Automatic climate control when an air conditioning system is ordered.
- \* Outside temperature display.
- \* A real time clock with display.
- \* Three (3) programmable video inputs.
- \* A useable temperature range from -40 degrees to 185 degrees F.
- \* Unlimited virtual switches.
- \* Selectable font sizes, types and colors for optimum user efficiency.
- \* Selectable color buttons and screen backgrounds.

All wiring to be appropriate gauge cross link with 311 degree F. insulation. All wires in the chassis shall be circuit numbered and function coded, in addition the SAE wiring will be color coded. The wiring shall be protected by 275 degree F. minimum high temperature flame retardant loom as required.

The starting system shall be supplied with the following:

- One (1) Cole-Hersee #2484 master battery switch.
- One (1) Cole-Hersee #EX26654A ignition switch.
- One (1) starter button.
- One (1) green LED indicator for battery "on".
- One (1) green LED indicator for ignition "on"

Includes 4 rocker switches on driver's dash:

1. Secondary Braking On/Off switch.
2. Secondary Braking Variance Control (High/Low) or (High/Med/Low).
3. Spare (if not replaced by customer requested options).
4. Spare (if not replaced by customer requested options).

Features included with the Multiplex system include:

### Back-up Alarm Disable Switch

A back-up alarm disable switch shall be installed in the cab dash within reach of the driver. The switch will allow the driver to turn the back-up alarm off. The back-up alarm shall automatically reset to sound the next time the transmission is placed in reverse.

### Incandescent Ground Lighting Below Each Door

The cab shall be equipped with Trucklite model #40003 sealed bulb, incandescent lighting under each cab door. The lights will be activated by either a single switch on the dash or each respective door switch.

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## Alternating Headlights

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

The completed system shall be capable of using high beam to override flashing function and will flash high beams only when the low beam headlamps are selected.

## Audible Alarm for Open Door Light

An audible alarm shall be wired to the open door light, which will sound when a door is open and the air brake is off with the vehicle in gear.

## **ROCKER SWITCH CONSOLE**

A three (3) section, double row switch console shall be provided with easy switch access to both the driver and officer. The console will consist of an angled driver's side panel, center main and angled officer's side panel.

## **OFFICER ROCKER SWITCH PANEL**

The officer's side switch panel shall be equipped with a color Mux Vista display.

## **DRIVER ROCKER SWITCH PANEL**

The color Mux Vista display will be mounted in the right hand side of the panel. The driver's side panel shall include a rocker type headlight switch with instrument lamp slide dimmer, intermittent windshield wiper/washer switch and secondary braking device rocker switches.

## **CENTER ROCKER SWITCH PANEL**

The center main rocker switch panel shall be a blank panel with no switches to accommodate flush mounted devices.

## **BATTERY JUMPER STUDS**

Battery jumper studs shall be provided in the driver's step area. The studs allow the vehicle to be jump started or cab to be raised in an emergency due to battery failure.

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## **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 J1587 data bus to reduce the number of redundant sensors.

The instrument panel shall contain the following gauges:

One (1) electronic tachometer with integral digital hour meter. The scale on the tachometer shall read from 0 to 3000 RPM. The hourmeter shall display engine hours of operation.

One (1) electronic speedometer with integral digital odometer/tripodometer. 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 5 to 85 MPH (5 to 140 KPH). The odometer shall display miles.

One (1) three function gauge with primary air pressure, secondary air pressure and fuel level. 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. The scale on the fuel level gauge shall read from empty to full.

One (1) four function gauge with engine oil pressure, coolant temperature, transmission oil temperature and a voltmeter. 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. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The scale on the transmission oil temperature gauge shall read from 100 to 300 degrees Fahrenheit (F). The scale on the voltmeter shall read from 8 to 16 volts.

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

## **RED LAMPS**

Stop Engine - indicates critical engine fault.

Park Brake - indicates park brake is set.

Low Fuel - indicates low fuel.

Cab Ajar - indicates tilt cab is not locked down. (1)

Volts - indicates high or low system voltage.

Low Oil Press - indicates low engine oil pressure.

High Coolant Temp - indicates excessive engine coolant temperature.

High Trans Temp - indicates excessive transmission oil temperature.

Low Air - indicates low air pressure in either system one or system two.

Low Coolant Level - indicates low engine coolant level. (1)

Low Oil Level - indicates low engine oil level. (1)

Air Filter - indicates excessive engine air intake restriction.

## **YELLOW LAMPS**

Check Engine - indicates non-critical engine fault.

Check Trans - indicates transmission fault.

Wait to Start - indicates active engine air preheat cycle. (2)

ABS - indicates anti-lock brake system fault.

Water in Fuel - indicates presence of water in fuel filter. (1)

Engine Maint - indicates engine maintenance is required. (1)



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## **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)

Low Trac - indicates low wheel traction for automatic traction control (ATC) equipped vehicles, also indicates mud/snow mode is active for ATC system. (1)

## **BLUE LAMP**

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).

The instrumentation system will provide a three second alarm every three minutes for the following situations:

Low fuel.

Water in fuel. (1)

(1) Feature only available when optionally equipped.

(2) Feature only available on engines with preheat capability.

## **OFFICER SPEEDOMETER**

An additional speedometer shall be provided and installed in the officer's side switch panel.

## **POWER AND GROUND STUDS - BATTERY DIRECT**

Power and grounding studs shall be provided and installed behind the electrical center cover with a breaker. The studs shall be #10 and capable of carrying up to a 40 amp battery direct load.

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## **SUPER AUTO EJECT 20 AMP KUSSMAUL**

A Kussmaul 20 amp Super auto-eject electrical receptacle with a yellow weatherproof cover and box shall be installed on the left 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 20 amp receptacle should not carry more than 16 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

## **BATTERY CONDITIONER 1200 KUSSMAUL PUMP PLUS**

A Kussmaul Pump Plus 1200 air compressor/battery conditioner shall be supplied.

The battery conditioner shall be mounted in the cab behind the driver's seat.

The air compressor shall be installed behind the driver's seat. The air compressor shall be plumbed to the air brake system to maintain air pressure.

The battery conditioner shall have a switch for selection of operation voltage source. When in the AC position it shall operate only from the shoreline.

The remote charge indicator will be located near the receptacle, viewable through the driver's side crew cab window.

## **MARKER LAMPS**

Five (5) I.C.C. DOT approved Weldon model #9186-1500-20 Light Emitting Diode (LED) cab marker lamps shall be installed on the face of the cab above the windshield.

## **BACKUP ALARM**

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

## **SCENE LIGHTS**

Two (2) FRC Focus 120 volt 750 watt lights and fixtures shall be installed on the front roof line.

## **SCENE LIGHTS**

Two (2) Whelen #810 Series clear halogen scene lights shall be installed on the sides of the cab. The lights shall be surface mounted one (1) each side of the cab. The lights shall be controlled by separate switches one (1) for the left side and one (1) for the right side.

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## **TRANSVERSE CAB COMPARTMENT**

A transverse compartment shall be provided behind the front doors of the cab. The compartment shall utilize the space behind the front seating positions and engine tunnel.

Painted aluminum ROM roll up doors with lockable latches shall be provided for the compartment.

ROM compartment lighting shall be provided at each door.

## **DOOR WARNING - CHEVRON**

Four (4) Chevron reflective signs shall be installed on the lowest portion of the inner door panels, one (1) on each door. A stripe of reflective tape shall be installed at the outer edge of each door.

## **INTERIOR LIGHTING**

The cab interior lighting shall consist of the following:

A red/white dome lamp shall be located over each door. The white lamp shall be activated by its respective door when opened and both activated by an individual switch on the light.

A red/white dome lamp with individual switches shall be located in the headliner, over the engine tunnel to serve as a tunnel surface light.

## **FLASHING DOOR AJAR LIGHT**

A red flashing door ajar light shall be located in the headliner, centered in the cab. The light shall be 6.00" long x 2.50" wide x 1.75" high and labeled "Do Not Move Apparatus". The light shall be wired to indicate an open door on the cab when the parking brake is released.

## **ENGINE TUNNEL LIGHT**

A Trucklite 4" diameter clear work light shall be provided and installed under the engine tunnel.

## **WEATHER BAND AM/FM RADIO WITH COMPACT DISC PLAYER**

A heavy duty Panasonic Weather Band AM/FM stereo radio with compact disc player and four (4) speakers shall be installed in the cab. The radio shall be installed above the driver. Two (2) speakers shall be installed overhead front with the other two (2) speakers in the upper rear corners of the cab.

## **12 VOLT RECEPTACLE**

A 12 volt cigarette lighter type receptacle shall be provided in the cab dash on the officer's side to act as a power source.

## **12 VOLT RECEPTACLE**

A 12 volt cigarette lighter type receptacle shall be provided in any customer specified location to act as a power source.

Location:

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## **CAMERA DUAL REARVIEW WITH DISPLAY ON VISTA SCREEN**

An ASA audiovox rearview camera shall be supplied for viewing through the color Vista display panel. One camera will be mounted in a location, as to afford the driver a clear view of the blind spot on the officer side of the vehicle. A second camera will be shipped to the OEM for installation in the body to afford the driver a clear view of the rear of the vehicle.

## **DASH AND HEADER TRIM XTREME DUTY**

The cab interior dash trim shall consist of a two (2) piece vacuum formed ABS composite driver, a high impact aluminum officer panel and a high impact aluminum center assembly. The center dash shall incorporate the integral rocker switch console and incorporate a latching electrical component access cover to allow complete access to the underside of the switch panel assembly and electrical harness and components.

The "A" pillar and center windshield post trim shall consist of a vacuum formed ABS composite driver, officer and center cover.

The header trim shall consist of a vacuum formed ABS composite driver, officer and a two (2) piece center HVAC cover. Mounted to the trim panels shall be two (2) 5.75" x 22.50" vinyl sunvisors.

## **INNER DOOR PANELS DA SANDED**

The inner door panels shall be a DA sanded aluminum panel. A "Fireman Friendly" cast steel pull handle shall be included with the front door panel.

## **ENGINE COVER**

The fixed type engine cover shall be a maximum of 23.00" high x 41.50" wide. The cover shall be an integral part of the cab and made of 0.19" thick aluminum.

The interior cab side shall be covered with a multi-layer mat consisting of; .25" thick sound absorbing closed-cell foam, a heavy weight sound barrier, a .06" thick non-slip vinyl wear surface with a pebble grain finish, and held in place by a pressure sensitive adhesive and aluminum cornering trim. All exposed seams are sealed to reduce moisture contamination and debris build up.

The engine side of the cover shall be heavily insulated with multi-layer insulating materials, consisting of foam, a 1.0 lbs per sq ft sound barrier with a facing that resists heat transfer, and held in place by adhesive, aluminum stick pins and retention caps. All exposed insulation seams and edges are sealed to reduce moisture contamination and debris build up.

## **MOBILE DATA TERMINAL PROVISION W/GLOVE COMPARTMENT - XTREME DUTY**

The cab interior dash trim officer panel shall consist of a high impact resistant aluminum module, which contains a glove compartment with a hinged non-locking door. The compartment size shall be 14.00" wide x 6.00" high x 6.00" deep.

A Mobile Data Terminal (MDT) provision shall be provided above the glove compartment. The MDT provision shall be recessed 3.00" below the surface of the dash. The surface area of the MDT provision shall be 16.00" wide x 14.00" deep.

A 20 amp 12AWG clean power and ground circuit will be provided to the MDT area.

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## **PAINT INTERIOR**

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

## **INTERIOR TRIM COLOR AND FLOOR MAT GRAY/GRAY/GRAY**

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

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

The cab interior floormat shall be gray in color.

The interior cab floor, engine tunnel sides and front seat risers shall be covered with a multi-layer mat consisting of; .25" thick sound absorbing closed-cell foam, a heavy weight sound barrier, a .06" thick non-slip vinyl wear surface with a pebble grain finish, and held in place by a pressure sensitive adhesive and aluminum cornering trim. All exposed seams are sealed to reduce moisture contamination and debris build up.

## **WINDSHIELD DEFOGGER FANS**

Two (2) individually switched all metal construction 6" windshield defogger fans shall be installed in the front cab corners.

## **HVAC SYSTEM**

The cab shall be equipped with a ceiling mounted HVAC system. The system shall consist of an overhead heater/defroster/air-conditioning unit mounted above the engine tunnel in a central location with dash mounted controls.

The ceiling mounted HVAC system includes sixteen (16) adjustable louvers. Six (6) forward facing louvers for windshield, 45,000 Btu's of heat at 460 cfm for defrosting. Six (6) rearward facing louvers to direct air for crew comfort and four (4) for driver and officer comfort. In "Cabin Mode" the system is designed to produce 60,000 Btu's of heat and 32,000 Btu's of cooling. The 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-conditioning compressor will be an engine driven Seltec TM-21 and utilize R-134A refrigerant.

The A/C lines will be a mixture of custom bent zinc coated steel fittings and Aeroquip flexible hose with E-Z clip fittings.

All heater system hoses, including auxiliary units shall be silicone with stainless steel constant torque clamps approved for use with silicone hose.

## **DELUXE INSULATION PACKAGE**

Additional insulation in the cab shall be installed to improve air-conditioning and/or heating in extreme weather climates as well as reducing road noise. The sides, roof and rear wall of the cab shall contain 1" thick multilayered insulation.

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## **CAB TILT ACTUATION**

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

The cab tilt actuation shall be with an electric over hydraulic lift pump with a control box on a pendant for safe visual operation.

The lift system shall have an ignition interlock and red lock down indicator lamp, which shall illuminate when holding "down" switch to indicate safe road operation. It shall be necessary to activate the master battery switch with the park brake set in order to tilt the cab.

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

Two spring loaded hydraulic hold down hooks outboard of the frame shall be installed for holding the cab securely to the frame.

A steel safety assembly shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety assembly shall fall over the lift cylinder when the cab is in the "up" position. A cable release system shall also be provided to clear the safety assembly from the lift cylinder when lowering the cab.

## **MANUAL CAB LIFT PUMP**

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

## **RECEPTACLE FOR CAB TILT CONTROL**

A receptacle shall be installed in the right hand side of the front bumper tail to provide a place to plug in the cab tilt remote control pendant.

## **WHEEL WELL LINERS**

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" wide made of vacuum formed ABS composite and a outer fenderette 3.50" wide made of 14 gauge 304 polished stainless steel.

## **EXTERIOR CAB ASSIST HANDLES**

Two (2) 18" knurled anti-slip one-piece exterior assist handles shall be installed, one (1) behind each cab door. The assist handle shall be made of 14 gauge 304 stainless steel and be 1.25" diameter to enable easy grabbing with the gloved hand.

# Harrisburg Fire Department

## **TWO TONE PAINT**

The cab shall be painted two tone with a finished break line 1.5" below the cab side windows and down to the top of the grill on the cab front fascia.

All cab painting must be completed prior to the installation of glass accessories or any other cab trim to assure complete paint coverage and maximum corrosion protection.

The entire cab must be disc ground to remove any surface oxidation or surface debris that may hinder the paint adhesion. After the surface is machine finished a high quality acid etching base primer shall be applied. Upon the application of required body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The entire cab then shall be coated with an intermediate solids or epoxy surfacer that is designed to fill minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color coats.

The cab shall be finish sanded with 360 grit paper, seams sealed with SEM seal sealer and painted with two (2) to four (4) coats of an acrylic urethane type system designed not only for color retention, but to resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene.

The maximum overall film thickness of the top coat shall not exceed five (5) mils.

A .5" (1/2") black pinstripe shall be applied on the break line between the two different colored surfaces.

The standard PPG (FBCH) paint shall be warranted for ten (10) years against cracking, checking or peeling and loss of gloss caused by chalking or fading, other paint warranties will vary by manufacturer (for example, Sikkens FLNA or Dupont Imron 6000).

Cab underside and doors shall be rustproofed with a ten (10) year or 100,000 mile warranty certificate against perforation issued in the Fire Department's name.

Upper Color; PPG – DBHS2185 – White  
Lower color; PPG – DBHS73787ALT – Red

## **HAND SAND AND BUFF FINISH**

The base coat clear coat finish shall be power sanded and machine finished to achieve a flat finish on all "A" visual surfaces.

# Harrisburg Fire Department

## **OPERATORS MANUAL AND PARTS LIST**

A chassis operator's manual and parts list with wiring and air plumbing diagrams shall be provided. The wiring and plumbing diagrams shall be of the chassis model.

## **ENGINE AND TRANSMISSION OPERATION MANUAL**

One (1) engine operation and maintenance manual and one (1) transmission operation manual shall be included in the Spartan operator's manual.

## **FIRE EXTINGUISHER**

A 2.5 pound BC D.O.T approved fire extinguisher shall be shipped loose with the cab.

## **ROAD SAFETY KIT**

A road safety kit shall be provided and shall consist of three (3) DOT approved reflective triangles.



# Harrisburg Fire Department

## **CHASSIS MODIFICATIONS**

### **LUBRICATION PLATE**

A permanent plate shall be installed in the Driver's compartment which indicates the type and quantity of the following fluids in the vehicle:

- Engine Oil
- Engine Coolant
- Transmission Fluid
- Drive Axle Fluid
- Air Conditioning Refrigerant, Air Conditioner Oil (if applicable)
- Power Steering Fluid
- Cab Tilt Fluid (if applicable)
- Transfer Case Fluid (if applicable)
- Pump Transmission Fluid (if applicable)
- Pump Primer Fluid (if applicable)
- Equipment Rack, Air Compressor, Generator, etc. . . . (If applicable)

### **VEHICLE DATA PLATE**

A permanent plate shall be installed in the Driver's compartment which indicates the following:

- Filter Part Numbers for the Engine, Transmission, air and fuel systems
- Serial Number for the Engine and Transmission
- Delivered Weights of the Front and Rear Axles
- Paint Code Brand and Code(s)
- Body Builder Project Number

### **OVERALL HEIGHT PLATE**

There shall be a placard located in direct view of the Driver which shall indicate the overall height of the vehicle.

### **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**

There shall be a placard mounted in the Driver's compartment which specifies the maximum number of personnel the vehicle is design to carry per NFPA standards. The placard shall be located in clear view of the Driver.

### **ACCIDENT PREVENTION**

If there is a rear bumper extension of 8" 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".

# Harrisburg Fire Department

## **BUMPER GRAVEL SHIELD**

The front bumper extension shall have a 3/16" NFPA compliant aluminum tread plate gravel shield. The gravel shield shall cover the full width of the front bumper to the front of the cab and the full height of the bumper on each end.

## **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.

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

The following shall be located in the bumper:

- One (1) Hannay EF2014-17-18 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 Red in color.
  - The hydraulic reel shall connect to the hydraulic pump with a 60' Amkus pigtail. The hose shall be Red in color.
- Mounting provisions for one (1) Harrisburg Fire Department supplied hydraulic combination tool(s).

Make: \_\_\_\_\_

- 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 equipped with 150' of 10/3 SOWY black 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 electrical junction box with yellow powder coat finish. The junction 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) 5-20 duplex straight-blade receptacle
      - One (1) 5-20 duplex straight-blade receptacle
      - One (1) 5-20 duplex straight-blade receptacle
      - One (1) 5-20 duplex straight-blade receptacle
  - One (1) EJB vertical apparatus mounting bracket - treadplate

# Harrisburg Fire Department

## **AIR HORN(S)**

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

## **MOTOR DRIVEN SIREN**

There shall be a motor driven, streamlined, rotary siren with chrome plated grill and housing recess mounted in the extended front bumper. The siren shall be properly wired with heavy copper cable for minimum voltage drop. Make: Federal, Model: Q2B.

- The siren shall be located at the center of the front bumper.

## **SIREN ACTIVATION**

There shall be two (2) foot switches to activate the siren, one (1) for the officer and one (1) for the driver. The switches shall be mounted on the floor in a location to prevent accidental activation.

## **EXHAUST**

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

## **12 VOLT ACCESSORY PLUG**

There shall be one (1) 12 volt accessory plug(s) furnished and installed in the cab area. Exact location shall be determined at the pre-construction meeting.

## **SCBA BRACKET IN CAB**

There shall be one (1) Zico walk-away type SCBA air pack bracket(s) provided with a CRS strap located in the cab transverse compartment streetside.

Location to be determined by the Harrisburg Fire Department at the pre-construction meeting.

## **MUDFLAPS**

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

## **ROAD EMERGENCY SAFETY KIT**

One (1) set of three dual faced triangular warning flares with fold away base complete with storage case per DOT requirements shall be provided with the completed apparatus.

One (1) 2.5 lb. ABC type vehicle fire extinguisher with bracket shall be provided and mounted in the cab or the front streetside compartment.

## **FUEL FILL**

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

# Harrisburg Fire Department

## **CAB TRANSVERSE COMPARTMENT**

There shall be one (1) transverse module for the following long tools and equipment, located in cab transverse compartment.

- The list of items to be stored in the transverse module shall be determined at the pre-construction meeting.
- One (1) Harrisburg Fire Department supplied Stokes Basket(s). Manufacturer, model number and dimensions of the Stokes Basket(s) shall be provided during the pre-construction meeting.

Dimensions of the Stokes Basket: \_\_\_" l x \_\_\_" w x \_\_\_" h

- Two (2) Harrisburg Fire Department supplied backboard(s). Manufacturer, model number and dimensions of the backboard(s) shall be provided during the pre-construction meeting.

Dimensions of the back boards: \_\_\_" l x \_\_\_" w x \_\_\_" h

- One (1) Harrisburg Fire Department supplied ladder(s) Little Giant Type 1A model 17 accessible from curb side.

Dimensions of the ladder: \_\_\_" l x \_\_\_" w x \_\_\_" h

- There shall be two (2) OnScene Solutions cargo straps provided to secure the stored equipment.

## **FOLDING STEP(S)**

There shall be two (2) NFPA approved folding step(s) furnished and installed. Each step shall be cast aluminum with heavy duty stainless steel spring and textured step surface.

Step shall be installed one each side of the cab behind the wheel wells to assist in installing and removing items from the transverse cab compartment.

Location(s): \_\_\_\_\_

There shall be two (2) 120 volt outlet(s) located in the cab area one each behind driver & officer seat.

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

# Harrisburg Fire Department

## **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. All Bidders shall be required to meet these minimum requirements.

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. Since such materials are available to all Manufacturers, the material specifications shall be strictly adhered to.

The fabrication of the body shall be formed sheet metal. Formed components shall allow the Harrisburg 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 Harrisburg 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.

# Harrisburg Fire Department

## **EXTERIOR ALUMINUM BODY**

The fabrication of the rescue 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, will 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 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, and sheet metal 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 of the body shall not be less than 3/16" aluminum 3003H-14 alloy NFPA nonskid compliant tread plate, fully and continuously welded. The roof shall be reinforced with 2" x 2" x 1/4" aluminum tubing running the full width of the body. A 2" rounded radius shall be provided along the body sides.

# Harrisburg Fire Department

## **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) 5/8" 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.

## **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" aluminum tread plate. Any stepping surface shall have a grip surface insert to meet NFPA requirements. 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 below the apparatus body. The tow eyes shall be fabricated from 1" thick steel plate and shall have a black powder coat paint finish.

## **GROUND LIGHTS**

Two (2) OnScene Solutions 9" LED Nightstick ground lights shall be mounted below the rear bumper. The ground lights shall be activated when the parking brake is set. There shall be 15 LEDs per 9" light. The light stick shall be rated at 100,000 hours of service. Each light stick shall be provided with a 5 year free replacement warranty.

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## **WHEEL WELL EXTERIOR PANEL**

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

## **STAINLESS STEEL BODY FENDERS**

The body wheel well openings shall be provided with round radius, polished stainless steel fenderettes. The fenderettes shall be bolted and easily replaceable if damaged. The fenderettes shall be installed using nylon washers to space them slightly away from the body to reduce buildup of moisture and/or debris.

## **WHEEL WELL LINERS**

The wheel wells shall be provided with an easily removable polymer, full depth 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.

## **SCBA BOTTLE COMPARTMENTS**

There shall be three (3) SCBA compartments located adjacent to the rear wheel. There shall be two (2) on the curbside of the apparatus and one (1) on the streetside. 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.



# Harrisburg Fire Department

## **ALUMINUM BODY PAINT SPECIFICATIONS**

The final finishing of this apparatus shall be to fire apparatus standards exhibiting excellent gloss, durability, and color retention properties. Commercial type paint finish shall not be acceptable. A warranty sheet with all conditions shall be provided with completed apparatus.

All flush mounted lights, drip moldings, windows, and other equipment shall be fitted to the apparatus prior to paint finishing, then removed to assure full paint coverage under all equipment.

The apparatus body shall be sanded smooth on all exterior surfaces to assure removal of all imperfections in metal surface and to assure good adhesion of paint to body. All metal surfaces shall be chemically cleaned and metal etched with acid cleaner prior to paint.

The body shall receive a corrosion resistant epoxy primer coat. The primer coat shall be lightly sanded to assure a smooth surface for a final coat. All seams and corners in sheet metal on interior and exterior shall be sealed with automotive type caulk prior to painting finish coat.

Prior to the assembly and reinstallation of lights, handrails, door hardware, and any miscellaneous items, an isolation tape, or gasket material must be used to prevent damage to the finish painted surfaces.

Touch-up paint shall be provided with completed apparatus.

## **PAINT FINISH**

The apparatus body shall be painted single color with Akzo Nobel Inc. - Sikkens "Autocryl" Acrylic Urethane Finish paint for a high gloss, hard finish.

- Color: RED
- Paint Number: PPG – DBHS73787ALT

The painted body shall be finished with a clear coat of acrylic urethane for paint protection and maximum quality finish.

## **PAINT WARRANTY**

The apparatus shall be provided with a seven (7) year warranty to the original Owner. Warranty is provided by "Sikkens" sponsored by AKZO Nobel. A "Sikkens Warranty" sheet with all conditions shall be provided with the delivered apparatus.

## **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.

## **COMPARTMENT INTERIOR FINISH**

The interior of compartments shall be painted with an epoxy primer then painted with a textured Zolotone paint finish. Paint color shall be gray.

# Harrisburg Fire Department

## **REFLECTIVE STRIPE**

The stripe shall conform to ASTM 4965, *Standard Specifications for Retroreflective Sheeting for Traffic Control*, Type III, Class 1 or Class 3.

## **REFLECTIVE STRIPE - CAB**

A 4" minimum reflective stripe shall be affixed to the cab.

- The stripe material shall be 3M Scotchlite 680.
- This reflective stripe shall be white in color.

## **REFLECTIVE STRIPE - BODY SIDES**

A 4" minimum reflective stripe shall be affixed to the sides of the body.

- The stripe material shall be 3M Scotchlite 680.
- This reflective stripe shall be white in color.

The stripe shall remain in a straight line from the front of the vehicle to the rear.

## **REFLECTIVE STRIPE - REAR OF BODY**

A 4" minimum reflective stripe shall be affixed to the rear face of the body.

- The stripe material shall be 3M Scotchlite 680.
- This reflective stripe shall be white in color.

## **LETTERING**

No lettering shall be provided on the completed unit.

# Harrisburg Fire Department

## **EXTERIOR COMPARTMENT DOORS**

### **ROLL-UP DOOR CONSTRUCTION**

The apparatus shall be equipped with Robinson Series III shutter exterior compartment doors. The doors shall be constructed of satin finished anodized aluminum slats. The slats exterior surface is flat, while the rear surface is concave to prevent loose equipment from interfering with door operation.

The aluminum extrusions shall be equipped with nylon end shoes that slide in extruded aluminum tracks for easy operation.

The shutter door shall have a pretension operator in a sealed alloy drum and positioned at the upper front portion of compartment to afford maximum clearances and head room for mounting equipment to ceiling of compartment.

Each shutter door shall be completely weather resistant assembly. Neoprene seals shall be provided on sides, bottom upper portion of the door and in between each slat.

Latching of the exterior compartment shutter door shall be with an aluminum, spring loaded full width lift bar. The lift bar shall latch itself under two (2) cam shaped strike blocks mounted on the outer door frame of the compartment. A magnetic door ajar switch system shall be provided and built into the striker blocks and the end caps of the lift bars. An extra wide finger pull shall be provided above each lift handle to assist in closing compartment doors.

Each shutter door shall decrease the compartment door frame opening approximately 2" in width and approximately 4-1/2" in height for the bottom section of door assembly.

### **EXTERIOR ROLL-UP DOOR FINISH**

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

The reflective stripe shall be applied over the roll-up doors. The stripe shall be precision machine cut for each seam of the roll-up doors.

# Harrisburg Fire Department

## **BODY HEIGHT MEASUREMENTS**

The vertical body dimensions shall be as follows:

### **AHEAD OF REAR AXLE**

	<b><u>Description</u></b>	<b><u>Dimension</u></b>
A	Bottom of Subframe to Top of Body	84.0"
B	Bottom of Subframe to Bottom of Body	25.0"
C	Vertical Door Opening - (Full Height Compartment)	
	-with roll-up door	67.5"
	-with hinged door	71.5"
	Vertical Door Opening - (Short Compartment)	
	-with hinged door	20.0"

### **ABOVE REAR AXLE**

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

### **BEHIND REAR AXLE**

	<b><u>Description</u></b>	<b><u>Dimension</u></b>
E	Bottom of Subframe to Bottom of Body	20.0"
F	Vertical Door Opening - (Full Height Compartment)	
	-with roll-up door	62.0"
	-with hinged door	66.0"
	Vertical Door Opening - (Short Compartment)	
	-with hinged door	17.5"

### **GENERAL**

	<b><u>Description</u></b>	<b><u>Dimension</u></b>
G	Bottom of Drip Rail to Top of Body	33.5"
H	Walk-in Interior Height	73.0" (min)

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

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## **BODY WIDTH DIMENSIONS**

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

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

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

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## STREETSIDE COMPARTMENT - FRONT (S1)

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.

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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 24" deep.
- There shall be one (1) 500 lbs. slide-out tray(s) approximately 16" deep and as wide as the compartment layout or door opening permits.
- 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.
- 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.
- One (1) Hannay EF2014-17-18 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 Red in color.
  - The hydraulic reel shall connect to the hydraulic pump with a 6' Amkus pigtail. The hose shall be Red in color.
- One (1) Hannay EF2014-17-18 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 a 6' Amkus pigtail. The hose shall be Blue in color.
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- The controls for the specified light tower(s).

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- One (1) Amkus model EF2S, 3 HP, 240 VAC hydraulic power unit(s). One (1) 240 VAC twist lock receptacle with switch shall be provided on wall within easy reach of operator for turning the power unit ON/OFF.
- Mounting provisions for two (2) Harrisburg Fire Department supplied hydraulic ram(s).

Make: Amkus Model: (1) 20R & (1) 40R.

- Mounting provisions for one (1) Harrisburg Fire Department supplied hydraulic cutter(s).

Make: AmkusAMK-25 Heavy Duty Cutter

- Mounting provisions for one (1) Harrisburg Fire Department supplied hydraulic spreader(s).

Make: Amkus AMK-30 Spreader 32"

- Mounting provisions for one (1) Harrisburg Fire Department supplied hydraulic accessory tool(s).

Make: AmkusRam Accessory Kit

- There shall be one (1) underbody slide-out step.
- One (1) OnScene Solutions LED Nightstik ground light mounted below the body.
- The 12 volt electrical distribution panel shall be located in the streetside front lower compartment.

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## STREETSIDE COMPARTMENT - AHEAD OF REAR WHEEL (S2)

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.

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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 24" 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.
- 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.
- 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.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- There shall be one (1) underbody slide-out step.
- One (1) OnScene Solutions LED Nightstik ground light mounted below the body.



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## **STREETSIDE COMPARTMENT - ABOVE REAR WHEEL (S3)**

The interior useable compartment width shall be approximately 59.0" wide.

The compartment door opening shall be approximately 52.0" wide.

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

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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 24" deep.
- One (1) vertically mounted OnScene Solutions LED Nightstik.

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## STREETSIDE COMPARTMENT - REAR (S4)

The interior useable compartment space shall be approximately 70.0" wide.

The compartment door opening shall be approximately 63.0" wide.

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

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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 24" deep.
- There shall be one (1) vertical compartment partition(s). Location and height shall be determined on the Sales Drawing.
- There shall be one (1) 3-drawer Lista tool cabinet located at base of compartment. Drawers shall be (1) 6" high, (1) 5" high & (1) 4" high with individual locks.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- 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 equipped with 150' of 10/3 SOWY black 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 electrical junction box with yellow powder coat finish. The junction 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) 5-20 duplex straight-blade receptacle
      - One (1) 5-20 duplex straight-blade receptacle
      - One (1) 5-20 duplex straight-blade receptacle
      - One (1) 5-20 duplex straight-blade receptacle
  - One (1) EJB vertical apparatus mounting bracket - treadplate

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- One (1) Hannay EFH1514-17-18 high pressure air hose reel(s) capable of storing 200' of high 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 3/16", 6,000 psi, high 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 Gray in color.
  - The fitting on the end of the high pressure air hose reel shall be a CGA-347 high pressure fitting.
  - The air supply shall be from the mobile breathing air system. A reel shut-off valve, pressure regulator, and 0-6,000 psi gauge shall be provided at the air control panel.
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- One (1) Bauer model CFSII-2S (Containment Type), two (2) position filling station(s) with cascade controls.
  - One (1) refill port shall be located on the front of the right side panel on the filling station.
  - Two (2) high pressure hose reel outlet port located on the rear of the filling station.
  - The fill station fill whip(s) shall terminate in a low pressure 2,216 psi, CGA-346 threaded SCBA connectors.
- There shall be one (1) underbody slide-out step.
- One (1) OnScene Solutions LED Nightstik ground light mounted below the body.

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## CURBSIDE COMPARTMENT - FRONT (C1)

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.

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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) adjustable shelf/shelves approximately 24" deep.
- There shall be two (2) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits.
- 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.
- There shall be one (1) vertical compartment partition(s). Location and height shall be determined on the Sales Drawing.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) Hannay EF2014-17-18 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 Black in color.
  - The hydraulic reel shall connect to the hydraulic pump with a 6' Amkus pigtail. The hose shall be Black in color.
- One (1) Hannay EF2014-17-18 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 Yellow in color.
  - The hydraulic reel shall connect to the hydraulic pump with a 6' Amkus pigtail. The hose shall be Yellow in color.
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- One (1) 120/240 volt load center.
- The FROG-D generator monitoring panel.

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- Two (2) Amkus model EF2S-XL, 3 HP, 240 VAC hydraulic power unit(s). Two (2) 240 VAC twist lock receptacle with switch shall be provided on wall within easy reach of operator for turning the power unit ON/OFF.
- Mounting provisions for two (2) Harrisburg Fire Department supplied hydraulic ram(s).

Make: Amkus(1) 30R & (1) 60R

- Mounting provisions for one (1) Harrisburg Fire Department supplied hydraulic cutter(s).

Make: Amkus Model: AMK-25 Speedway Cutter.

- Mounting provisions for one (1) Harrisburg Fire Department supplied hydraulic spreader(s).

Make: AmkusAMK-28 Spreader.

- Mounting provisions for one (1) Harrisburg Fire Department supplied hydraulic accessory tool(s).

Make: Amkus AMK-30 CX chain Package

- Air storage module consisting of six (6) 6,000 psi, ASME air storage cylinders.
- There shall be one (1) underbody slide-out step.
- One (1) OnScene Solutions LED Nightstik ground light mounted below the body.

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## CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)

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.

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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 three (3) adjustable shelf/shelves approximately 24" 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.
- There shall be two (2) slide-out smooth aluminum vertical tool board(s).
- Mounting for eight (8) customer rescue struts and six (6) extensions on tool boards, final layout and configuration to be determined at pre-construction meeting.
- There shall be one (1) vertical compartment partition(s). Location and height shall be determined on the Sales Drawing.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- There shall be one (1) underbody slide-out step.
- One (1) OnScene Solutions LED Nightstik ground light mounted below the body.

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## **CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C3)**

The interior useable compartment width shall be approximately 59.0" wide.

The compartment door opening shall be approximately 52.0" wide.

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

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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) adjustable shelf/shelves approximately 24" deep.
- There shall be one (1) vertical compartment partition(s). Location and height shall be determined on the Sales Drawing.
- One (1) vertically mounted OnScene Solutions LED Nightstik.

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## CURBSIDE COMPARTMENT - REAR (C4)

The interior useable compartment space shall be approximately 70.0" wide.

The compartment door opening shall be approximately 63.0" wide.

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

- There shall be NO keyed lock on this roll-up compartment door.
- One (1) nylon strap shall be provided to assist in closing the 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) adjustable shelf/shelves approximately 24" 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.
- Customer supplied chain saws and equipment to be mounted on tray. Final layout and configuration to be determined at pre-construction. (1) 20" vent saw, (1) 14" K-12 saw, (1) 20" chainsaw & (2) 5 gallon fuel cans.
- There shall be two (2) slide-out smooth aluminum vertical tool board(s).
- There shall be one (1) vertical compartment partition(s). Location and height shall be determined on the Sales Drawing.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).



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- One (1) Hannay ECR1616-17-18 cable reel(s) capable of storing 150' of 10/4 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 10/4 SOWY black cable, a molded plastic ball clamp, and a single heavy duty L14-30 twist-lock female plug.
  - One (1) Akron model EJB electrical junction box with yellow powder coat finish. The junction box shall include:
    - a 12" pigtail that terminates in an L14-30 configuration to match the cable on the cord reel. The outlet configuration shall include:
      - One (1) L6-30 single twist lock receptacle
      - One (1) L6-20 single twist lock receptacle
      - One (1) L6-20 single twist lock receptacle
      - One (1) L6-20 single twist lock receptacle
  - One (1) EJB vertical apparatus mounting bracket - treadplate
- One (1) Hannay EFH1514-17-18 high pressure air hose reel(s) capable of storing 200' of high 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 3/16", 6,000 psi, high 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 Gray in color.
  - The fitting on the end of the high pressure air hose reel shall be a CGA-347 high pressure fitting.
  - The air supply shall be from the mobile breathing air system. A reel shut-off valve, pressure regulator, and 0-6,000 psi gauge shall be provided at the air control panel.
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- There shall be one (1) underbody slide-out step.
- One (1) OnScene Solutions LED Nightstik ground light mounted below the body.

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## **REAR ENTRY DOOR**

Access to the interior body compartment shall be provided through a rear entry door. The door opening shall be approximately 32" wide x 77" high.

Construction of the rear entry door shall be with 1/8" aluminum exterior smooth plate, the interior door pan shall be constructed from 1/8" aluminum treadplate.

The door shall be hung on full height 14 gauge stainless steel hinges with 1/4" stainless steel pins. The hinge shall be bolted to the door and body with stainless steel machine screws at 5" offset centers. The hinge shall be slotted horizontally and vertically for ease of adjustment. A polyester barrier film gasket shall be placed between the stainless steel hinge and door.

The latch mechanism shall include a paddle handle on the inside and a locking Hansen offset bent "D"-ring handle on the exterior. A polyester barrier film gasket shall be placed between the stainless steel handles and the aluminum door panels. The door latch shall be a double catch two-point safety slam latch recessed inside the double panel door with strike plate mounted top and bottom of the door frame.

## **ENTRY HANDRAILS**

There shall be two (2) handrails provided at entry door, one (1) vertical on exterior of body on door handle side, and one (1) on inside of door. The interior handrail shall be angled for optimum use when entering or exiting the walk-in portion of the body.

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

## **WINDOW(S)**

There shall be one (1) 18" wide x 22" vertical sliding window(s) installed in the entrance door. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

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## 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 tie off accessories provided with the 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 of the storage brackets shall be determined by the Harrisburg Fire Department at the pre-construction meeting.
- One (1) Warn model XD9000i - 9,000 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 125' 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 forward portion of the wheel well panel 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 curbside of the body in the forward portion of the wheel well panel 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 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.

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## **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 # 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.

Tray(s) shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

### **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.

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.

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## **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.

## **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.

## **COMPARTMENT LIGHTING**

OnScene Solutions LED Nightstik shall be provided with 30 LEDs per 18" light section. The following are minimum lighting requirements:

- Full Height Compartments 54" Section ( 90 LEDs )
- Wheel well Compartments 36" Section ( 60 LEDs )
- Rear Rescue Compartment 54" Section ( 90 LEDs )
- Low Compartments 18" Section ( 30 LEDs )

The light stick shall be rated at 100,000 hours of service and shall be provided with a 5 year free replacement warranty.

## **HIGH 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, high 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.

The hose reel shall have a captive type nylon roller assemblies to permit hose to feed directly off the reel and away from the compartment. Air hose shall have a ball clamp located near end of hose.

## **HYDRAULIC HOSE REEL**

Hydraulic hose reel shall be Hannay EF2014-17-18 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.

The hose reel shall have a captive type nylon roller assemblies to permit hose to feed directly off the reel and away from the compartment. Hydraulic hose shall have a ball clamp located near end of hose.

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## **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.

## **FILL STATION**

There shall be one (1) Bauer model CFSII-2S (Containment Type) filling station(s) with cascade controls furnished and installed in the apparatus body per the itemized compartment list.

This specification is for a containment type fill station to refill self-contained breathing apparatus (SCBA). The fill station shall be designed for a maximum working pressure of 6,000 psig. All equipment shall be new and of current design and manufacture. Used and/or refurbished equipment is unacceptable.

## **"CONTAINMENT TYPE" FILL STATION**

A front loading, 2-position, containment type fill station shall totally enclose the SCBA cylinders during the refilling process. The fill station shall contain the cylinder and any fragments of the cylinder in the unlikely event of a cylinder exploding during the refilling process. The filling station shall vent the expanding air away from the Operator.

The fill station shall incorporate a 1/4" thick steel plate door reinforced by two (2), 1/4" thick steel SCBA holders, providing a total 1/2" thick steel protective safety barrier between the Operator and the cylinder refilling process, and a 1/4" thick steel outer enclosure. The fill station shall be ergonomically designed for maximum Operator safety and convenience during the refilling process. The fill station door and cylinder holder assembly shall tilt out towards the Operator providing unobstructed access to the cylinder holder to load and unload the cylinders at waist height. Each cylinder holder shall be lined with UHMW polyethylene strips to prevent scuffing the outer surface of the cylinders. For complete Operator protection, the fill station shall include a 3-point pneumatic safety interlock system. An interlock shall prevent refilling the cylinders while the fill station door is open. A manually activated door interlock shall latch the fill station door in the closed position. The third interlock verifies that the fill station door is closed and latched. The refilling process can commence only when all three (3) safety interlocks are satisfied, **NO EXCEPTIONS.**

Two (2) fill hoses shall be located within the fill station's steel outer enclosure. Each fill hose shall be equipped with a bleed valve and fill adapter of choice. There shall be CGA 346 male adapters to anchor the fill hoses when not in use.

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## CONTROL AND FILLING PANEL

The central fill/control panel shall be furnished to facilitate the filling of SCBA bottles from the storage system. All of the filling and air flow control shall be controlled and monitored from this central panel.

The top control panel shall include:

- Inlet pressure gauge from storage
- One (1) 0-6,000 psi adjustable regulators with relief valve set for storage bottle pressure
- One (1) fill pressure gauge
- Two (2) fill pressure gauges and "On/Off" valves, one (1) for each fill position
- Door interlock switch

The side control panel shall include:

- Storage pressure gauge for each air storage cylinder.
- High pressure valve for each air storage cylinder.
- External supply air connection for filling storage cylinders.

The panel shall be designed in such a way so that each filling whip can be protected with its own individual relief valve. This will allow for a full range of filling pressures offering maximum protection.

All piping and tubing shall be properly supported and protected to prevent damage from vibration during shipment, operation or maintenance. Piping and tubing shall be installed in a neat and orderly arrangement, adapting to the contours of the station. All instrument tubing shall be 300 series stainless steel.

All control panel mounted pressure gauges shall have a 2-1/2" diameter face and be liquid filled. All panel mounted components shall be labeled with an engraved nameplate.

## TESTING AND PREPARATION OF FILL STATION

The fill station design shall have been tested and certified by an independent third-party testing organization per NFPA 1901. Proof of such testing shall be available for review upon the Fire Department's request. Each fill station shall be bench tested by the Manufacturer prior to shipment. A copy of the Manufacturer's test report shall accompany the unit at shipment, **NO EXCEPTIONS**.

An Operator's instruction and maintenance manual shall be supplied with the unit. The manual shall be as detailed as possible, outlining all operating and maintenance instructions. The manual shall include detailed illustrated drawings along with a complete parts list for all illustrated components. Warnings and safety precautions shall be included in the manual.

A fill station nameplate shall be securely affixed to station's frame in a conspicuous location.

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## **UNDERBODY SLIDE-OUT STEP**

There shall be underbody slide-out step(s) furnished and installed. Each platform shall be constructed from 9" deep "Diamond Back" non-slip vented aluminum stair treads. Step slide shall be securely held in both out and stored position, utilizing a heavy duty pneumatic cylinder. Each pneumatic cylinder shall be designed to have an over center location which will assist the step in both extension and retraction. Each step shall be designed to hold 500 lbs., and reinforced to prevent flexing or damage.

## **STEP / GROUND LIGHTS**

OnScene Solutions 9" LED Nightstik light(s) shall be placed at each entry door and step where personnel climb on or descend from the apparatus to ground level. All of the ground lights shall be activated when the parking brake is set. There shall be 15 LEDs per 9" light. The light stick shall be rated at 100,000 hours of service. Each light stick shall be provided with a 5 year free replacement warranty.



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## **WALK-THRU INTERIOR FEATURES:**

No cab/body walk-through connection shall be provided.

## **ROOF HATCH AND SKYLIGHT**

The apparatus roof area shall be specially reinforced for the installation of a Bomar No. 995-1111 low profile hatch and skylight. The opening shall be suitable for use as an escape hatch, for ventilation, and supplemental light in the interior of the apparatus.

The hatch shall be approximately 20" x 20" in size and manufactured from polycarbonate plastic. Two (2) interior "L" handle type latches shall be provided to hold hatch closed. Two (2) compression type door checks are used to hold door in open position.

## **INTERIOR SPECIFICATIONS**

### **INTERIOR INSULATION**

Following the sheet metal fabrication the roof area, upper exterior walls and the entry door of the apparatus body shall be insulated with 1-1/2" rigid polyurethane foam insulation. This insulation shall be the type that will not absorb moisture, move once in place or deteriorate. Mat type fiberglass or spray in foam insulation are not acceptable.

### **INTERIOR FINISH**

The interior of the apparatus body shall have a fully maintenance free and durable finish. The interior finish shall be installed on the ceiling, front wall, and interior side walls from top of exterior compartments to ceiling height.

The interior panels shall be installed with sheet metal screws with white plastic plugs covering the screws. The seams between FRP panels, interior corners, and exterior corners shall be trimmed with white plastic molding.

The interior finish shall be bright white pebble grain FRP.

### **INTERIOR WALKWAY SIDE WALLS**

Walkway side walls from floor level to top of exterior compartments shall be aluminum tread plate panels. These panels shall be flanged over walkway kickboards and bolted to rear of exterior compartments with flush stainless steel bolts.

### **INTERIOR WALKWAY FLOOR**

The NFPA compliant 3/16" aluminum tread plate walkway floor shall be installed above the barrier, with a 1" high vertical break on each side of the floor panel to form a watertight splash and kickboard along the walkway sides.

The walkway floor area continuously welded at all cross seams to provide a watertight finish, so that a water hose may be used to flush-out walkway area. Flooring shall be bolted to body sub-frame with countersunk stainless steel bolts.

### **INTERIOR SUB-FLOOR**

Above the body subframe shall be an isolation sheet that shall prevent outside elements from permeating the full length sound and thermal barrier of 3/4" thick air core plastic. The sheet shall be fabricated from the same type of material as is used in the subframe. The isolation sheet shall be flanged on both sides with a 1" high vertical break.

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## **AIR CONDITIONER - HEATER**

One (1) Dometic Penguin, model 620515, low profile, 120 VAC, 60 cycle, single phase air conditioner(s) shall be provided and installed on the body roof. The unit shall be a roof top contemporary contoured integral evaporator/condenser type with built-in heating elements.

Each unit shall be rated at minimum of 13,500 BTU cooling capacity with a heating element rated at 5,600 BTU.

A three-speed fan shall supply a maximum/minimum of 335/250 cfm air flow capacity.

The roof mounted air conditioner shall be approximately 9.5" high x 29" wide x 40" long and weigh approximately 96 pounds. The opening in roof shall be properly reinforced to support the air conditioner and shall be supplied with a 1" rise to minimize moisture condensation under the unit.

## **STREETSIDE INTERIOR AREA (IS1)**

### **INTERIOR CABINET - COUNTER HEIGHT**

There shall be one (1) cabinet(s) provided on interior above the interior deck surface formed by exterior compartment ceilings. Cabinet(s) shall be framed in from the top of the interior deck surface to the ceiling of the walk-in area. Each cabinet shall be approximately 47" wide x 31" high x 60" deep.

Forward walk-in area over exterior compartment S1 with rear facing door. Storage area for customer supplied swift water equipment.

- The above cabinet(s) shall have horizontally hinged aluminum lift-up door(s) and painted with a hammer tone powder coat paint finish to match cabinet color choice.

## **STREETSIDE INTERIOR AREA (IS2)**

### **INTERIOR DECK MATERIAL**

The interior deck areas, over the top of the exterior side compartments shall be smooth aluminum. The deck areas shall be trimmed with aluminum edge moldings.

# Harrisburg Fire Department

## **STREETSIDE INTERIOR AREA (IS3)**

### **WINDOW(S)**

There shall be one (1) 32" wide x 22" high horizontal sliding window(s) installed. The window shall slide open towards the front of the vehicle such that wind pressure would tend to shut the window. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish. Sliding style windows shall be complete with a sliding screen.

### **COMMAND DESK - MAP BOARD**

A slanted command desk with storage below shall be provided over the counter as specified by the Harrisburg Fire Department.

The desk top shall have a full length stainless steel .18" pin hinged top to gain access to the storage area below. The storage cabinet shall be fabricated of .125" smooth aluminum. A lip shall be provided at the lower edge of the writing surface to prevent items from sliding off.

Located directly in front of window.

- A sliding steel panel painted white shall be provided along back wall that can be slid in front of windows or slid to rear. Panel shall provide a dri-erase marker/magnetic board.

## **STREETSIDE INTERIOR AREA (IS4)**

### **INTERIOR DECK MATERIAL**

The interior deck areas, over the top of the exterior side compartments shall be smooth aluminum. The deck areas shall be trimmed with aluminum edge moldings.

# Harrisburg Fire Department

## **CURBSIDE INTERIOR AREA (IC1)**

### **INTERIOR CABINET - COUNTER HEIGHT**

There shall be one (1) cabinet(s) provided on interior above the interior deck surface formed by exterior compartment ceilings. Cabinet(s) shall be framed in from the top of the interior deck surface to the ceiling of the walk-in area. Each cabinet shall be approximately 47" wide x 31" high x 60" deep.

Forward walk-in area over exterior compartment C1 with rear facing door. Storage area for customer supplied swift water equipment.

- The above cabinet(s) shall have horizontally hinged aluminum lift-up door(s) and painted with a hammer tone powder coat paint finish to match cabinet color choice.

## **CURBSIDE INTERIOR AREA (IC2)**

### **INTERIOR CABINET - COUNTER HEIGHT**

There shall be one (1) cabinet(s) provided on interior above the interior deck surface formed by exterior compartment ceilings. Cabinet(s) shall be framed in from the top of the interior deck surface to the ceiling of the walk-in area. Each cabinet shall be approximately 36" wide x 31" high.

- The above cabinet(s) shall have double vertically hinged aluminum door(s) and painted with a hammer tone powder coat paint finish to match cabinet color choice.
- There shall be two (2) vertically adjustable shelves in each of the above cabinets.

## **CURBSIDE INTERIOR AREA (IC3)**

### **INTERIOR BENCH SEAT**

The interior body walkway shall be provided with a squad bench seat along the side wall. The bench seat base shall be fabricated of 1/8" aluminum tread plate to form a under seat storage compartment. A hinged door with single point "D"-ring handle and latch shall be provided at the rear of the seat compartment.

The seat shall be fabricated of 3/4" exterior grade plywood with 3" thick foam and heavy duty vinyl covering. The seat backrest shall be approximately 12" high x 2" thick and constructed the same as the seat. Four (4) automotive style lap type seat belts shall be installed.

- Two (2) customer supplied 6' D-handle hooks to be stored under walk-in seat.
- One (1) customer supplied 10' straight handle pike pole stored under walk-in seat.
- One (1) customer supplied 14' extension ladder (Duo Safety series 1000-A 18.5" wide x 4.56" thick x 9'3" long).

### **INTERIOR AIR PACK BRACKET**

Four (4) SCBA air pack bracket(s) shall be provided at the interior bench seat recessed mounted in the seat backrest. The exact model and layout shall be determined at the pre-construction meeting.

# Harrisburg Fire Department

## **CURBSIDE INTERIOR AREA (IC4)**

- There shall be one (1) 12V outlet(s) provided in the front face of the component console.

## **INTERIOR CABINET - COUNTER HEIGHT**

There shall be one (1) cabinet(s) provided on interior above the interior deck surface formed by exterior compartment ceilings. Cabinet(s) shall be framed in from the top of the interior deck surface to the ceiling of the walk-in area. Each cabinet shall be approximately 54" wide.

- Rearward curbside countertop storage area shall be provided with open netting restraint to secure equipment on adjustable shelf and countertop.
- There shall be one (1) vertically adjustable shelf above curbside countertop, approximately 108" long. It shall have a 1.25" lip to contain items while minimizing space used.

## **INTERIOR DECK MATERIAL**

The apparatus interior decks areas as noted, over exterior side body compartments, shall be covered with plastic interlocking grating.

The grating shall be easily removable, maintenance-free and not subject to mechanical damage.

The deck area shall be trimmed with aluminum moldings or an aluminum tread plate rolled 1" lip to form a storage area to hold equipment in place.

# Harrisburg Fire Department

## **12 VOLT ELECTRICAL SYSTEM**

The apparatus shall be equipped with a heavy duty 12 volt wiring system installed with proper devices for the fire service. The system shall include all components necessary for complete operation. The low voltage electrical system shall meet or exceed current NFPA 1901 Standards and SAE J1292 requirements.

System wiring shall be stranded copper conductors of a gauge rated to carry 125% of the maximum current for which the circuit is protected. All wiring shall be Type GXL, XLP Cross-Linked Polyethylene, conductors with function identification at least every 3" by color coding and permanent marking with circuit identification. Identification shall correspond with schematics provided with the vehicle. Wiring shall be mounted in high temperature protective loom secured to body with bolted on clips with nylon wire ties. The XLP wiring shall have an operating temperature range of -60°F/-51°C to 257°F/125° C. Cross-linking changes thermoplastic polyethylene to a thermosetting material which has greater resistance to environmental stress cracking, cut-through, ozone, solvents and soldering than either low or high density polyethylene.

Where wire passes through sheet metal, grommets shall be used to protect wire and wire looms. Wiring shall be protected against heat, liquid contamination and damage. Electrical connections shall be with double crimp water-tight heat shrink connectors. Wire nut, insulation displacement, or insulation piercing connections shall NOT BE ACCEPTABLE.

All 12 volt wiring running from front to back of apparatus body shall be run in full length electrical wiring raceway down each side of body.

All 12 volt circuits shall be protected with properly rated low voltage over current devices. Such devices shall be readily accessible and protected against overheating, mechanical damage, and water spray. All switches, relays, terminals and connectors shall have a rating of 125% of maximum current for which the circuit is protected.

A complete electrical wiring schematic of actual system shall be provided with finished apparatus. Similar or generic type electrical schematics shall NOT BE ACCEPTABLE.

A low voltage final 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.

# Harrisburg Fire Department

## **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. The cables shall be shielded from exhaust tubing and the muffler. Large rubber grommets shall be provided where cables enter the battery compartment.

## **BATTERY SWITCH**

One (1) battery "On/Off" switch with green "BATTERY ON" indicator shall be installed in cab within easy reach of Driver to activate the battery system. The switch and switch solenoid 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.

## **ENGINE COMPARTMENT LIGHT**

Engine compartment light(s) shall be supplied and installed by the cab/chassis manufacturer for illumination during service and maintenance.

## **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.

## **WALK-IN INTERIOR LIGHTS**

There shall be four (4) 7" diameter interior dome light(s) with clear lens provided with a switch at the entry door for body 12 volt interior lighting. Location to be determined at the preconstruction meeting.

- Interior body clear 12volt dome lights shall be provided with a timer. If walk-in light switch is activated when Battery Master switch is in off position, timer shall shut off lights after specified time expires.

There shall be two (2) 7" diameter interior dome light(s) with red lens provided with a switch at the entry door for body 12 volt interior lighting. Location to be determined at the preconstruction meeting.

# Harrisburg Fire Department

## **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 warning lights as detailed in the warning light section

Two (2) Whelen CAST-4V, 4-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 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 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.

No Cab Step/Door Ground Lights

## **LICENSE PLATE LIGHT**

One (1) Arrow #437 chrome plated license plate light shall be installed on the rear of the apparatus body. License plate light shall be wired to the headlight circuit of chassis. Nutsert inserts shall be provided for license plate installation.

## **ELECTRONIC SIREN**

One (1) Federal PA300MSC, 200 watt electronic siren with standard microphone shall be provided in cab. The siren shall be installed as close to the 12 volt control panel as possible.

## **SIREN SPEAKER**

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



# Harrisburg Fire Department

## **SIDE SCENE LIGHTS**

There shall be four (4) Whelen 900 series (9" x 7") recess mounted Opti-Scene lights (90E000ZR) provided on the upper body. Each light will have a 8-32 degree gradient lens and chrome flange. They will be equally divided between the curbside and streetside.

Two (2) switches shall be provided, one (1) for the streetside scene lights, and one (1) for the curbside scene lights.

## **REAR SCENE LIGHTS**

Two (2) Whelen 900 series (9" x 7") recess mounted Opti-Scene lights (90E000ZR) shall be provided on the upper rear body. Each light will have 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**

One (1) Whelen TA-4437A, eight (8) halogen lights, split two-piece housing, traffic directional warning device with 30' control cable shall be located on upper rear body. The control head shall be located in the cab within easy reach of Driver.

- The traffic directional light shall be surface mounted on upper rear body.

# Harrisburg Fire Department

## WARNING LIGHT PACKAGE

The following lighting package includes all of the minimum warning light requirements to comply with the most recent NFPA 1901 Fire Apparatus Standard.

## UPPER WARNING LIGHT SYSTEM

### 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>
Section 1:	- One (1) RED Linear LED - Side Facing - One (1) Red Corner LED	Clear
Section 2:	Red	Clear
Section 3:	Clear Linear LED	Clear
Section 4:	Red	Clear
Section 5:	Red Linear LED	Clear
Section 6:	Clear Linear LED	Clear
Section 7:	Clear Linear LED	Clear
Section 8:	Red Linear LED	Clear
Section 9:	Red	Clear
Section 10:	Clear Linear LED	Clear
Section 11:	Red	Clear
Section 12:	- One (1) RED Linear LED - Side Facing - One (1) Red Corner LED	Clear

The lightbar shall be separately switched at the 12 volt control panel.

All clear lights shall shut down when the parking brake is set to comply with "Blocking" mode requirements as outlined in NFPA 1901.

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## ZONES B AND D - SIDE WARNING LIGHTS

### UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") Linear Super-LED lights (90RR5FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange. The lights shall be switched at the 12 volt control panel in the cab.

### UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") Linear Super-LED lights (90RR5FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange. The lights shall be switched at the 12 volt control panel in the cab.

## ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") Linear Super-LED lights (90RR5FRR) provided on the rear of the body, one (1) each side. Each light shall have a red lens and chrome flange. The lights shall be switched at 12 volt control panel in cab.

There shall be two (2) Whelen 700 series (7" x 3") Linear Super-LED lights (70R02FRR) provided on the rear of the body, one (1) each side adjacent to the 900 series lights described above. Each light shall have a red lens and chrome flange. The lights shall be switched at 12 volt control panel in cab.

## **LOWER LEVEL WARNING LIGHTS**

### 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.

### ZONES B AND D - CAB INTERSECTOR LIGHT (CAB FRONT CORNERS)

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.

### ZONES B AND D - BODY INTERSECTOR LIGHT (BODY WHEELWELL AREA)

There shall be two (2) Whelen 600 series (6" x 4") Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome finished flange. The lights shall be switched at 12 volt control panel in cab.

### ZONES B AND D - BODY INTERSECTOR LIGHT (BODY REAR CORNERS)

There shall be two (2) Whelen 600 series (6" x 4") Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome finished flange. The lights shall be switched at 12 volt control panel in cab.

### ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen 600 series (6" x 4") Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome finished flange. The lights shall be switched at 12 volt control panel in cab.

# Harrisburg Fire Department

## **LINE VOLTAGE SYSTEM**

### **ONAN PTO GENERATOR**

The apparatus shall be equipped with a Onan "Protec AC" PTO generator system with a capacity of 35,000 watts at 120/240 volt, 291/145 amps., single phase, 60 cycles.

### **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 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 GOVERNOR - ELECTRONIC SPEED CONTROL**

The apparatus shall be equipped with Electronic Speed Controls to maintain a stable cycle output from generator. The governor system shall be activated after the vehicle parking brake is applied and the transmission selector is placed in neutral.

# Harrisburg Fire Department

## **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.

## **CIRCUIT BREAKER BOX**

The circuit breaker box shall be a Cutler Hammer or equal with cover, and circuit breakers rated to the wire size and load demand.

## **OUTLETS AND CIRCUITS**

The generator shall supply the electrical equipment and outlets outlined below. Proper circuit protection shall be installed as noted:

- Two (2) 120 volt exterior outlets, one (1) each side rear of body.
  - The receptacle shall be 20 amp, straight-blade ( NEMA 5-20R ).

There shall be one (1) 120 volt outlet(s) located in the walk-in area of the body.

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

## **INTERIOR BODY 120 VOLT LIGHTING**

There shall be five (5) 120 volt light(s) installed in the walk-in area of the body. The fixtures shall be single bulb, 22 watt fluorescent lights with fully enclosed protective lens covers, and flush aluminum trim. Each light shall be recessed down the center of the walkway.

The operation of the lights shall be at the entry doorway area. The interior lights shall be wired to the generator system with a 15 amp circuit breaker protection.

Three (3) lights to be located centered above interior walkway.

One (1) light to be located above curbside interior counter top at side window.

One (1) light to be located above streetside interior command desk at side window.

# Harrisburg Fire Department

## ELECTRICAL SYSTEM GENERAL DESIGN 120/240 VAC SYSTEM

### General

Any fixed line voltage power source producing alternating current (ac) line voltage shall produce electric power at 60 cycles plus or minus 5 cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed.

### Grounding

Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC.

Ungrounded systems shall not be used.

Only stranded or braided copper conductors shall be used for grounding and bonding.

An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

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 Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

### Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

Provisions shall be made for quickly and easily placing the power source into operation.

The control shall be marked to indicate when it is correctly positioned for power source operation.

A power source specification label shall be permanently attached to the apparatus near the operators control station.

Portable generator installations shall comply with Article 445 (Generators) of the NEC.

# Harrisburg Fire Department

## Overcurrent Protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 144 inches in length.

For fixed power supplies, all conductors in the power supply assembly shall be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit.

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device shall be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit.

## Wiring Methods

Fixed wiring systems shall be limited to either Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit or Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit.

Electrical cord or conduit shall be supported within six (6) inches of any junction box and at a minimum of every 24 inches of continuous run.

Supports shall be made of nonmetallic materials or corrosion protected metal.

All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.

## Wiring Identification

All line voltage conductors located in the main panel board shall be individually and permanently identified.

The identification shall reference the wiring schematic or indicate the final termination point.

When pre-wiring for future power sources or devices, the non-terminated ends shall be labeled showing function and wire size.

## Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, shall be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location shall be not less than 24 inches from the ground. Receptacles on off-road vehicles shall be a minimum of 30 inches from the ground.

The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position.

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## Dry Locations

All receptacles located in a dry location shall be of the grounding type. Receptacles shall be not less than 30 inches above the interior floor height.

All receptacles shall be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps.

If the receptacles are direct current, or other than single phase, they shall be so marked.

## Listing

All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards.

Receptacles used for direct current voltages shall be rated for the appropriate service.

## **120/240 VOLT WIRING SYSTEM**

The complete wiring and electrical installation shall conform to present National Electrical Code and the National Fire Protection Association standards.

The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture, and severe continuous usage. The following electrical components and wire shall be the minimum acceptable standard for this type of apparatus.

**Wiring:** All electrical wiring shall be fine stranded copper type THHN. The wire shall be sized to load and circuit breaker rating. Wiring shall be color coded and printed with function every 3" for easy identification.

**Conduit:** All 120/240 volt wiring in the apparatus body shall be through flexible moisture resistant reinforced conduit, with proper seal tight connectors and hardware.

**Labeling of Equipment:** All circuit breakers shall be labeled to indicate purpose. Metal engraved or plastic coded labels shall be provided for all exterior and interior outlets indicating output amperage.

**Schematic:** An "As-Built" electrical wiring diagram schematic will be supplied with the completed apparatus.



# Harrisburg Fire Department

## 120 / 240 VOLT SCENE LIGHTING

### FRONT CAB-MOUNTED SCENE LIGHT(S)

Two (2) quartz floodlight(s) shall be provided on the front face of the chassis cab. Each light shall be mounted in a Brow-style mounting flange.

Each light shall be wired directly to the electrical generator system with Carflex conduit and stranded copper wire. The floodlights shall be protected with circuit breakers rated at the proper amperage and wire size.

- There shall be one (1) 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.

### SIDE UPPER RECESSED SCENE LIGHTS

Four (4) Fire Research Focus, model FCA200-M12, 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 240 volt bulb. The bulb shall draw 4.2 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.

Make: Fire Research  
Model: Focus  
P/N: FC200-M12

- The lights shall be controlled by switches in the lower portion of the front compartment.

Two (2) Fire Research Focus, model FCA656-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 8' and be less than 5' when collapsed. 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.

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.

Make: Fire Research  
Model: Focus  
P/N: FC656-M10-ON-6F3

# Harrisburg Fire Department

## **COMMAND LIGHT TOWER w/ 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 six (6) weatherproof, 1,500 watt, 240 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 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.

Power for light bank shall be transmitted through power collecting rings thus allowing 360+ degrees rotation in either direction.

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) indicator light to indicate when light bank is out of roof nest position
- One (1) indicator light to indicate when light bank is rotated to proper nest position
- One (1) back light rotation switch

Command Light controls shall be located per the 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 under 20 seconds.

The overall size of the nested light tower shall be approximately 41" wide x 73" long x 12-3/4" high, and weigh approximately 310 lbs.

A flashing warning light shall be provided in cab, indicating when a light tower is not in nested position.

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.

An operation, maintenance, and parts manual shall be provided with the delivered apparatus.

The light tower shall be mounted to roof of the cab which shall be reinforced as necessary to support weight of the light tower.

# Harrisburg Fire Department

## **EQUIPMENT**

The following equipment shall be furnished with the completed apparatus:

### **ASSORTED FASTENERS**

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.

### **FLASHLIGHTS**

Six (6) Streamlight Survivor, Division 2, portable rechargeable flashlight(s) and charger(s) shall be provided. Each flashlight shall be orange in color. Each flashlight shall have a 12 volt DC fast charging station and mount.

The flashlight(s) shall be mounted on the apparatus, location as per the Harrisburg Fire Department.