

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **NFPA 1901-2009**

The National Fire Protection Association "Standard for Automotive Fire Apparatus", 2009 edition, is hereby adopted and made a part of these specifications, the same as if it were written out in full detail, with the exception of the section dealing with "Equipment Recommended for Various Types of Apparatus". Bidders shall provide the equipment requested herein and the buyer shall supply the rest before the apparatus is put into service. It is the intent of the purchaser to purchase an apparatus that meets 100% of the minimum standards defined and outlined in NFPA 1901-2009 edition. There are to be no exceptions to this requirement.

### **PREREQUISITE BIDDING REQUIREMENTS**

Any manufacturer submitting a proposal or bid, to these specifications, shall meet the following conditions:

- The manufacturer of the apparatus herein specified, shall be wholly owned (100%) and managed by a Company, Corporation, and/or Parent Company that is wholly based and permanently resides in the United States of America.
- The Company, Corporation, and/or Parent Company, and all assets belonging to such, shall be wholly owned and managed (100%) by the entities specified above.
- Any proposal, bid, or response to these specifications by any foreign based, owned, or managed (in part or in whole) Company, Corporation, and/or Parent Company shall be cause for immediate rejection.
- Any proposal, bid, or response to these specifications by any Company, Corporation, and/or Parent Company, that is owned, operated, managed, or held in contract, in part or wholly by a partnership or other agreement, shall be cause for immediate rejection.

Exceptions to these conditions will not be allowed under any circumstances.

### **CONSTRUCTION DOCUMENTATION**

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

1. The manufacturers record of apparatus construction details, including the following information:
  - Owners name and address
  - Apparatus manufacturer, model, and serial number
  - Chassis make, model, and serial number
  - GAWR of front and rear axles
  - Front tire size and total rated capacity in pounds or kilograms
  - Rear tire size and total rated capacity in pounds or kilograms
  - Chassis weight distribution in pounds with water and manufacturer mounted equipment (front and rear)
  - Engine make, model, serial number, rated horsepower and related speed, and governed speed
  - Type of fuel and fuel tank capacity
  - Electrical system voltage and alternator output in amps

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- Battery make, model, and capacity in cold cranking amps (CCA)
- Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
- If applicable, the pump make, model, rated capacity in gallons or liters per minute, and serial number
- Pump transmission make, model, serial number, and gear ratio, if unit is equipped with a pump
- If applicable, the auxiliary pump make, model, rated capacity in gallons or liters per minute, and serial number
- Water tank certified capacity in gallons or liters
- On aerial apparatus, the device type, rated vertical height in feet or meters, rated horizontal reach in feet or meters, and rated capacity in pounds or kilograms
- Paint manufacturer and paint number(s)
- 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 an aerial device, the certification of inspection and test for the aerial device, and all the technical information required for inspections to comply with NFPA 1914, Standard for Testing Fire Department Aerial Devices

5. If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source

6. If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation

7. 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)

8. Written load analysis and results of the electrical system performance tests

9. When the apparatus is equipped with a water tank, the certification of water tank capacity

### **OPERATION AND SERVICE DOCUMENTATION**

The contractor shall supply, at time of delivery, at least two (2) sets of complete operation and service documentation covering the completed apparatus as delivered and accepted. The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof.

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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 manufacturer
3. Source of service and technical information
4. Parts and replacement information
5. Descriptions, specifications, and ratings of the chassis, pump, and aerial device
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 aerial device, and any auxiliary systems
9. Precautions related to multiple configurations of aerial devices, if applicable
10. Instructions regarding the frequency and procedure for recommended maintenance
11. Overall apparatus operating instructions
12. Safety considerations
13. Limitations of use
14. Inspection procedures
15. Recommended service procedures
16. Troubleshooting guide
17. Apparatus body, chassis, and other component manufacturers warranties
18. Special data required by this standard
19. Copies of required manufacturer test data or reports, manufacturer certifications, and independent third-party certifications of test results
20. 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.

### **STATEMENT OF EXCEPTIONS**

The proposed apparatus as described in this specification document and all related material with the bid package shall meet or exceed all applicable sections for the category of apparatus as defined by NFPA 1901, unless specifically noted within this specification or other official documents associated with this bid.

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Should any area, section or portion of the apparatus not meet the intent and applicable requirements, a clearly defined listing or explanation of what and why compliance was not achieved shall be provided to the purchaser at the time of delivery.

### **INTENT OF SPECIFICATIONS**

It is the intent of these specifications to cover the furnishing and delivery to the purchaser of a complete apparatus equipped as herein specified. With a view to obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover the general requirements as to the type of construction, together with certain details as to finish, equipment, and appliances with which the successful bidder must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 50 years.

Each bidder shall furnish satisfactory evidence of his ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. The bidder shall also show that they are in a position to render prompt service and furnish replacement parts for said apparatus.

### **CONTRACTOR'S SPECIFICATIONS**

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform.

These specifications shall indicate size, type, model, and make of all component parts and equipment.

### **TIMELY PROPOSALS**

It is the bidder's responsibility to see that their proposals arrive on time. Late proposals, facsimiles, e-mails, telegram, or telephone bids shall not be considered.

### **DRAWINGS**

All bid drawings shall be stamped PRELIMINARY DRAFT.

- A total of six (6) "C" size (18" x 24") drawings and one (1) 11" x 17" drawing shall be supplied
- All drawings shall be drawn and printed in a 3/8 to 1 scale
- Compartment door opening dimensions shall be shown on table on the drawing which shall refer to each compartment number, such as L1, R1, T1
- Drawings shall be five (5) views. (left, right, front, rear, top) with the exception of chassis that are not always available as AutoCAD drawings
- Rear plumbing, such as 2-1/2" discharges, rear steamers, and direct tank fills, shall be shown
- Ladders shall be labeled with a letter designation referring to the table for an explanation of the ladder type
- OAL (overall length) in feet & inches -

Estimated length shall be rounded up to the nearest inch

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- OAH (overall height) in feet & inches

Estimated height shall be rounded up to the nearest inch

- Body dimensions shown - pump house width & front of the body to centerline of the rear axle
- Wheelbase in inches
- Estimated in-service weight
- Turning clearance radius
- Front and rear overhang in inches
- No pump panel or instrument panel controls, discharges or inlets. To be blank and labeled "Pump Panel"
- Water tank outline
- Foam tank(s) fill towers
- Exterior mounted hard suction hose
- Warning lights
- D.O.T. lights
- Generator outline
- No front bumper layout
- Rollup doors will be shown in open position. Lap doors will be shown in the closed position
- Compartment depth break over measurement. The measurement where the compartment switches from full depth to shallow depth
- Angle of approach and departure
- Top view of chassis

Text Block Items

- Chassis model
- Water tank capacity
- Foam tank capacity
- Hose bed capacity in cubic feet
- Total compartment cubic feet
- Drawing box is to read "BID" and utilize the bid number
- Drawings shall be printed on white paper with black ink; blue line drawings shall not be acceptable.

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### **PURCHASER'S OBLIGATIONS**

The purchaser reserves the right to accept or reject any or all bids on such basis as the purchaser deems to be in its best interest. All bidders shall be advised that the purchaser is not bound in any manner to automatically accept the lowest bid. The purchaser shall only be obligated to purchase the lowest bid that meets these detailed specifications as closely as possible.

### **SAFETY REQUIREMENTS**

It is required that the bidder shall meet all State and Federal safety standards and laws that are in effect on the date of the bid for the item(s) that are being specified and the particular use for which they are meant.

### **ACQUAINTANCE WITH SPECIFICATIONS**

It is the responsibility of the bidder to review all of the bidding requirements. Failure of a bidder to be acquainted with this information shall not relieve them from any obligations of the bid requirements.

### **QUALITY AND WORKMANSHIP**

The design of the apparatus shall embody the latest approved automotive engineering practices. Experimental designs and methods shall not be acceptable.

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

### **GENERAL CONSTRUCTION**

The complete apparatus, assemblies, subassemblies, component parts, and so on, shall be designed and constructed with due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subjected when placed in service.

All parts of the apparatus shall be strong enough to withstand the general service under full load. The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

The apparatus shall be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between the front and rear axles, and side to side loading that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters; shall be carried without overloading or damaging the apparatus as per requirements defined in NFPA 1901.

The main apparatus body structure shall have an approximate width of 100" in order to maximize the enclosed compartment space of the apparatus. The 100" wide measurement represents the main body structure measured from the bottom, outermost rear corners of the apparatus body structure. Components affixed or fastened to the apparatus will increase the body width proportionately.

### **LIABILITY**

The bidder, if their bid is accepted, shall defend any and all suits and assume all liability for the use of any patented process, device or article forming a part of the apparatus or any appliance furnished under the contract.

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### **WARRANTY**

A copy of the warranties for the chassis, pump, body, paint, and water tank shall be furnished with each bidder's proposal.

### **BID FORMS / SPECIFICATIONS**

All bid forms shall be submitted on the attached bid form. The bid form and/or these specifications shall be filled out by checking either the "YES" or "NO" column for each and every section/paragraph. Failure to use this form and/or these specifications shall be cause for immediate rejection of any bid.

### **EXCEPTION TO SPECIFICATIONS**

The following chassis, pump, and body specifications shall be strictly adhered to. Exceptions shall be allowed if they are equal to or superior to that specified (as judged by the customer), and provided they are listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS". Exception lists shall refer to the specification page number. Each check in the "NO" column shall be listed and fully explained. Where no check is made in a particular paragraph with either "YES" or "NO", it shall be assumed the bidder is taking exception to that paragraph. If a paragraph contains an empty column, where the bidder neglected to check the proper "YES" or "NO" column, it is assumed the bidder is not conforming to the requirements of this paragraph. If no explanation is given in the "EXCEPTIONS TO SPECIFICATIONS" document, the bid is subject to immediate rejection.

### **PROPOSALS TAKING TOTAL EXCEPTION TO THESE SPECIFICATIONS WILL BE IMMEDIATELY REJECTED.**

The buyer is aware that all bidders shall have to take some exceptions therefore; BIDDERS THAT TAKE NO EXCEPTIONS shall BE REQUIRED TO MEET EVERY PARAGRAPH TO THE FULLEST EXTENT SHOULD THEIR BID BE ACCEPTED. It is the intent of the purchaser to receive bids that do not require telephone calls or other communications to ascertain what a bidder is intending to supply.

Upon delivery, the apparatus shall be inspected against THESE specifications and not those supplied by the bidder with their proposal. Deviations shall not be acceptable unless they were noted as exceptions at the time of bid and the apparatus shall be rejected until said deviations are corrected to the satisfaction of the buyer.

Decisions regarding equal to or better than, shall be the sole responsibility of the recipient of the bids rather than those companies submitting bids. All deviations, regardless of significance must be explained in the "EXCEPTIONS TO SPECIFICATIONS" section of the bid.

When exceptions are not taken but inconsistencies are noted in the submitted detailed specifications, the bid may be subject to rejection.

### **ROADABILITY**

The apparatus, when fully equipped and loaded, shall be capable of the following performance while on dry paved roads that are in good condition:

- From a standing start, the apparatus shall be able to attain a speed of 35 mph (55 kmph) within 25 seconds on a level road.
- The apparatus shall be able to attain a minimum top speed of 50 mph (80 kmph) on a level road.

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- The apparatus shall be able to maintain a speed of at least 20 mph (30 kmph) on any grade up to and including 6 percent.

The maximum top speed of the apparatus shall not exceed the tire manufacturer's maximum speed rating for the tires installed on the apparatus.

### **FAILURE TO MEET TESTS**

In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials.

Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes as required to conform to any clause of the specifications within 30 days after notice is given to the bidder of such changes, shall be cause for rejection of the apparatus.

Permission to keep or store the apparatus in any building owned or occupied by the Department during the specified period, with the permission of the bidder, shall not constitute acceptance. No Exceptions

### **PROPOSAL SEQUENCE**

Bid specifications shall be submitted in the same sequence as these specifications for ease of checking compliance. There shall be no exceptions allowed to this requirement. The apparatus committee intends to be thorough during the evaluation of bids process. In order to maximize efficiency and minimize the time it takes to thoroughly evaluate all received bids this requirement must be strictly adhered to.

### **AWARD OF CONTRACT**

All bids submitted shall be good for a minimum of 30 days during which time bid securities submitted with the proposals shall be held by the purchaser. Criteria for the award shall include, but not be limited to, the following:

- Apparatus Performance And Safety Levels / Considerations
- Completeness of proposal
- Accuracy of accompanying data
- Past performance of bidder
- Compliance with the detailed specifications
- Compliance with purchasers request(s) for personnel qualifications or certifications
- Exceptions and clarifications
- Financial stability of bidder
- Local representation of the manufacturer
- Serviceability of the proposed apparatus
- Service capabilities of the bidder's local representative
- Compliance with NFPA 1901

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- Any other factor the purchaser deems relevant

After the evaluation and award process is complete, all bidders shall be notified of the results and securities shall be returned.

### **MODEL**

The chassis shall be a Metro Star model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

### **MODEL YEAR**

The chassis shall have a vehicle identification number that reflects a 2015 model year.

### **COUNTRY OF SERVICE**

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

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. Spartan Chassis is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from Spartan Chassis or their OEM needed to be in compliance with those regulations.

### **APPARATUS TYPE**

The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 750 gallons per minute (3000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

### **VEHICLE TYPE**

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

### **AXLE CONFIGURATION**

The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

### **GROSS AXLE WEIGHT RATINGS FRONT**

The front gross axle weight rating (GAWR) of the chassis shall be 20,000 pounds.

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

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### **GROSS AXLE WEIGHT RATINGS REAR**

The rear gross axle weight rating (GAWR) of the chassis shall be 27,000 pounds.

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

### **PUMP PROVISION**

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location.

### **CAB STYLE**

The cab shall be a custom, fully enclosed, MFD model with a 10.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

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

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the "A" pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 131.10 inches with 54.00 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner in the non-raised roof area and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 49.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

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The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 61.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.50 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 33.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 21.50 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.50 inches.

### **OCCUPANT PROTECTION**

The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The system components shall include:

- Driver steering wheel airbag
- Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags
- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
- Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event
- Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM
- Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent pending), officer side knee airbag, and advanced seat belts for each occupant in the cab.

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The APS frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95<sup>th</sup> percentile Hybrid II test dummies.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

The APS side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50<sup>th</sup> percentile ES-2re test dummies.

### **CAB FRONT FASCIA**

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the "Classic" design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

### **FRONT GRILLE**

The front fascia shall include a box style, 304 stainless steel front grille 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches. The upper portion of the grille shall be hinged to provide service access behind the grille.

### **CAB UNDERCOAT**

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

### **CAB SIDE DRIP RAIL**

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

### **CAB PAINT EXTERIOR**

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

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied.

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Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

### **CAB PAINT MANUFACTURER**

The cab shall be painted with PPG Industries paint.

### **CAB PAINT PRIMARY/LOWER COLOR**

The lower paint color shall be PPG FBCH 71096 ALT Red.

### **CAB PAINT WARRANTY**

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

### **CAB PAINT INTERIOR**

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

### **CAB ENTRY DOORS**

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate.

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

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.

### **CAB ENTRY DOOR TYPE**

All cab entry doors shall be full length in design to fully enclose the lower cab steps.

### **CAB INSULATION**

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

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### **CAB STRUCTURAL WARRANTY**

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN CHASSIS, INC. LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

### **CAB TEST INFORMATION**

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

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

### **ELECTRICAL SYSTEM**

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

### **OEM WIRING**

The wiring system shall include a custom J1939 interface harness drop provided by the chassis manufacturer designed to meet the requirements provided by the OEM.

### **MULTIPLEX DISPLAY**

The multiplex electrical system shall include a Weldon Vista IV display which shall be located on the left side of the dash in the switch panel. The Vista IV shall feature a full color LCD display screen which includes a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screen shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista IV display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

### **DATA RECORDING SYSTEM**

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The following information shall be recorded:

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

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

### **ACCESSORY POWER**

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 225 amp battery direct power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections.

### **AUXILIARY ACCESSORY POWER**

An auxiliary set of power and ground studs shall be provided and installed behind the electrical center cover with a 40 amp breaker. The studs shall be 0.38 inch diameter and capable of carrying up to a 40 amp load switched with the master power switch.

### **EXTERIOR ELECTRICAL TERMINAL COATING**

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

### **ENGINE**

The chassis engine shall be a Cummins ISL9 engine. The ISL9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse power at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250 foot pounds of torque at 1400 RPM with 543 cubic inches (8.9 liters) of displacement.

The ISL9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2013 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

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

### **CAB ENGINE TUNNEL**

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an inch thick aluminum. The tunnel shall be a maximum of 41.50 inches wide X 25.50 inches high.

### **DIESEL PARTICULATE FILTER CONTROLS**

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

### **ENGINE PROGRAMMING HIGH IDLE SPEED**

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

### **ENGINE HIGH IDLE CONTROL**

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

### **ENGINE PROGRAMMING ROAD SPEED GOVERNOR**

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

### **AUXILIARY ENGINE BRAKE**

The engine shall utilize a variable geometry turbo (VGT). The VGT auxiliary engine brake shall be an integral part of the turbo and shall offer a variable rate of exhaust flow, which when activated shall slow the engine and in turn slow the vehicle.

The VGT shall actuate the vehicle's brake lights when engaged as an auxiliary brake. A cutout relay shall be installed to disable the VGT when in pump mode or when an ABS event occurs. The VGT engine brake shall activate at a 0% accelerator throttle position when in operation mode.

### **AUXILIARY ENGINE BRAKE CONTROL**

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

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The variable geometry turbo brake shall be controlled via a virtual button on the Vista display and control screen. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

### **ELECTRONIC ENGINE OIL LEVEL INDICATOR**

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

### **FLUID FILLS**

The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

### **ENGINE DRAIN PLUG**

The engine shall include an original equipment manufacturer installed oil drain plug.

### **ENGINE WARRANTY**

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

### **REMOTE THROTTLE HARNESS**

An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a pump control switch, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch and high idle indicator light.

### **ENGINE PROGRAMMING REMOTE THROTTLE**

The engine ECM discreet wire remote throttle circuit will be turned on for use with a discreet wire based pump controller.

### **ENGINE PROGRAMMING IDLE SPEED**

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

### **ENGINE FAN DRIVE**

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

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **ENGINE COOLING SYSTEM**

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

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

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injection molded polymer eleven (11) blade fan with a fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.

### **ENGINE COOLING SYSTEM PROTECTION**

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame color.

### **ENGINE COOLANT**

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

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

### **ENGINE COOLANT FILTER**

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

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **ELECTRONIC COOLANT LEVEL INDICATOR**

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

### **ENGINE PUMP HEAT EXCHANGER**

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

### **COOLANT HOSES**

The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.

### **ENGINE COOLANT OVERFLOW BOTTLE**

A remote engine coolant overflow bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overflow rather than allow the fluid to drain on the ground. The overflow bottle provided on the cooling system shall only be a catch bottle and shall not return excess coolant back into the surge tank.

### **ENGINE AIR INTAKE FILTER AND RESTRICTION W/REPLACEABLE ELEMENT**

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

The engine shall also include an air intake filter which shall be bolted to the frame and located under the front of the cab on the right hand side. The system shall utilize a replaceable dry type filter which ensures dust and debris remains safely contained inside the housing during operation via leak-tight seals. The service cover shall be located on the bottom of the housing, eliminating the chance of contaminating the air intake system during air filter service.

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

### **AIR INTAKE PROTECTION**

A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **ENGINE EXHAUST SYSTEM**

The exhaust system shall be mounted below the frame in the outboard position with the SCR canister in line rearward of the DPF. The exhaust system shall utilize a 90-degree bend in the exhaust tubing from the turbo into a side inlet DPF canister that allows the entire system to be pulled forward. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps.

### **DIESEL EXHAUST FLUID TANK**

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

### **ENGINE EXHAUST ACCESSORIES**

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

### **ENGINE EXHAUST WRAP**

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

### **TRANSMISSION**

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

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

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
6th	0.65:1 (if applicable)
Rev	5.03:1

### **TRANSMISSION MODE PROGRAMMING**

The transmission, upon start-up, will select the fifth speed operation without the need to press the mode button.

### **TRANSMISSION FEATURE PROGRAMMING**

The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

<u>Function ID</u>	<u>Description</u>	<u>Wire assignment</u>
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

### **TRANSMISSION SHIFT SELECTOR**

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

### **ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR**

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE**

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

### **TRANSMISSION COOLING SYSTEM**

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

### **TRANSMISSION DRAIN PLUG**

The transmission shall include an original equipment manufacturer installed oil drain plug.

### **TRANSMISSION WARRANTY**

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

### **PTO LOCATION**

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 4:00 o'clock position.

### **DRIVELINE**

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

### **MIDSHIP PUMP / GEARBOX**

A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.

### **MIDSHIP PUMP / GEARBOX MODEL**

The midship pump/gearbox provisions shall be for a Waterous CSUC20 pump.

### **MIDSHIP PUMP GEARBOX DROP**

The Waterous pump gearbox shall have a "C" (medium length) drop length.

### **MIDSHIP PUMP RATIO**

The ratio for the midship pump shall be 2.27:1.

### **MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE**

The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 80.00 inches.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **PUMP SHIFT CONTROLS**

One (1) pump shift control panel shall be mounted on the lower left section of the center dash panel. The following shall be provided on the panel: a three (3) position locking toggle switch; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline. One (1) label indicating pump instructions and the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver's position per NFPA **16.10.1.3**. The road mode shall be selected when the switch is in the up position and pump mode shall be selected when the switch is in the down position.

The center switch position shall exhaust air from both pump and road sides of the pump gear box shift cylinder.

### **PUMP SHIFT CONTROL PLUMBING**

Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25 inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system.

### **FUEL FILTER/WATER SEPARATOR**

The fuel system shall have a Fleetguard FS1003 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

A secondary fuel filter shall be included as approved by the engine manufacturer.

### **FUEL LINES**

The fuel system supply and return lines installed from the fuel tank to the engine shall be reinforced nylon tubing rated for diesel fuel. The fuel lines shall be brown in color and connected with brass fittings.

### **FUEL SHUTOFF VALVE**

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

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

### **ELECTRIC FUEL PRIMER**

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

### **FUEL TANK**

The fuel tank shall have a capacity of fifty (50) gallons and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length. The baffled tank shall be made of 14 gauge aluminized steel. The exterior of the tank shall be painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

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

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

### **FUEL TANK FILL PORT**

The fuel tank fill ports shall be offset with the left fill port located in the rearward position and the right fill port located in the middle position on the fuel tank.

### **FUEL TANK SERVICEABILITY PROVISIONS**

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

### **FRONT AXLE**

The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-20. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle.

### **FRONT AXLE WARRANTY**

The front axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

### **FRONT WHEEL BEARING LUBRICATION**

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

### **FRONT SHOCK ABSORBERS**

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

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

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

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **FRONT SUSPENSION**

The front suspension shall include a nine (9) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds.

### **STEERING COLUMN/ WHEEL**

The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

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

### **ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR**

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

### **POWER STEERING PUMP**

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type.

### **FRONT AXLE CRAMP ANGLE**

The chassis shall have a front axle cramp angle of 50-degrees to the left and 45-degrees to the right.

### **POWER STEERING GEAR**

The power steering gear shall be a TRW model TAS 65 with an assist cylinder.

### **CHASSIS ALIGNMENT**

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

### **REAR AXLE**

The rear axle shall be a Meritor model RS-25-160 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 27,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **REAR AXLE DIFFERENTIAL LUBRICATION**

The rear axle differential shall be lubricated with oil.

### **REAR AXLE WARRANTY**

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

### **REAR WHEEL BEARING LUBRICATION**

The rear axle wheel bearings shall be lubricated with oil.

### **VEHICLE TOP SPEED**

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

### **REAR SUSPENSION**

The single rear axle shall feature a Reyco 79KB suspension which shall offer a vari-rate, self-leveling captive slipper type conventional multi-leaf spring suspension with 57.50 inch X 3.00 inch springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

A helper spring shall be provided in addition to the standard spring pack to help prevent vehicle sway during aggressive cornering.

The rear suspension capacity shall be rated at 21,000 to 33,000 pounds.

### **FRONT TIRE**

The front tires shall be Michelin 385/65R22.5 "L" tubeless radial XFE regional tread.

The front tire stamped load capacity shall be 19,840 pounds per axle with a speed rating of 65 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Tire Intermittent Service Rating load capacity shall be 20,000 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to one (1) hour of loaded travel with a one (1) hour cool down prior to another loaded run.

### **REAR TIRE**

The rear tires shall be Michelin 12R-22.5 16PR "H" tubeless radial XDN2 all-weather tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Tire Intermittent Service Rating load capacity shall be 28,880 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to one (1) hour of loaded travel with a one (1) hour cool down prior to another loaded run.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **REAR AXLE RATIO**

The rear axle ratio shall be 5.13:1.

### **TIRE PRESSURE INDICATOR**

There shall be a voucher provided with the chassis for a pop up style tire pressure indicator at each tire valve stem. The indicator shall provide visual indication of pressure in the specific tire.

The tire pressure indicators shall be redeemed upon the vehicle manufacturer's receipt of the voucher for installation by the customer.

### **FRONT WHEEL**

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

### **REAR WHEEL**

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

### **WHEEL TRIM**

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

### **BRAKE SYSTEM**

A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

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

A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

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

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

### **FRONT BRAKES**

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

### **REAR BRAKES**

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type. The brakes shall feature a cast iron shoe.

### **PARK BRAKE**

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

### **PARK BRAKE CONTROL**

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

The parking brake actuation valve shall be mounted on the center of the tunnel within easy access of both the driver and officer positions.

### **REAR BRAKE SLACK ADJUSTERS**

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

### **REAR BRAKE DUST SHIELDS**

The rear brakes shall be equipped with brake dust shields.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **AIR DRYER**

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

### **FRONT BRAKE CHAMBERS**

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

### **REAR BRAKE CHAMBERS**

The rear axle shall include TSE 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.

### **AIR COMPRESSOR**

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

### **AIR GOVERNOR**

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.

### **MOISTURE EJECTORS**

Manual pet-cock type drain valves shall be installed on all reservoirs of the air supply system.

### **AIR SUPPLY LINES**

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

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

### **AIR TANK SPACERS**

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **REAR AIR TANK MOUNTING**

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

### **WHEELBASE**

The chassis wheelbase shall be 214.00 inches.

### **REAR OVERHANG**

The chassis rear overhang shall be 37.00 inches.

### **FRAME**

The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width.

Proposals calculating the frame strength using the "box method" shall not be considered.

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

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

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

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

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

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

### **FRAME WARRANTY**

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN CHASSIS, INC. LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.

### **FRAME CLEAR AREA**

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

### **FRAME PAINT**

The frame shall be powder coated black prior to any attachment of components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-cured pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

Any proposals offering painted frame with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

### **FRONT BUMPER**

A one piece, two (2) rib wrap-around style, polished stainless steel front bumper shall be provided. The material shall be 10 gauge 304 stainless steel, 12.00 inches high and 99.00 inches wide.

### **FRONT BUMPER EXTENSION LENGTH**

The front bumper shall be extended approximately 21.00 inches ahead of the cab.

### **FRONT BUMPER EXTENSION FRAME WIDTH**

The front bumper extension frame shall feature an overall width of 48.25 inches.

### **FRONT BUMPER APRON**

The 21.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

### **FRONT BUMPER COMPARTMENT CENTER**

The front bumper shall include a hose tray compartment in the bumper apron located in the center that shall measure 58.00 inches wide X 6.00 inches deep. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. The compartment shall include a cover constructed of 0.19 inch thick bright embossed aluminum tread plate.

### **FRONT BUMPER COMPARTMENT COVER HARDWARE**

The front bumper compartment shall include a 7.00 inch stainless lift handle at the top center of the compartment lid. Gas cylinder stays shall hold the cover open. The cover shall held in the closed position via two (2) pull to release rubber "T" style hold down handles located one (1) at each end of the cover.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **AIR HORN**

The front bumper shall include two (2) Hadley brand E-Tone air horns which shall measure 21.00 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish on the exterior and a painted finish deep inside the trumpet.

### **AIR HORN LOCATION**

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

### **AIR HORN RESERVOIR**

One (1) air reservoir, with a 2084 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

### **ELECTRONIC SIREN SPEAKER**

There shall be one (1) Cast Products Inc. model SA4301, 100 watt speaker provided. The speaker shall measure 6.20 inches tall X 7.36 inches wide X 3.06 inches deep. The speaker shall include a flat mounting flange which shall be polished aluminum.

### **ELECTRONIC SIREN SPEAKER LOCATION**

The electronic siren speaker shall be located on the front bumper face on the right side outboard of the frame rail in the far outboard position.

### **FRONT BUMPER TOW HOOKS**

Two (2) heavy duty tow hooks, painted to match the chassis frame, shall be installed in a rearward position out of the approach angle area, bolted directly to the side of the chassis frame with grade 8 bolts.

### **CAB TILT SYSTEM**

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

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

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

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

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

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

### **CAB TILT CONTROL RECEPTACLE**

The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

### **CAB WINDSHIELD**

The cab windshield shall have a surface area of 2825.00 square inches and be of a two (2) piece wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self locking window rubber.

### **GLASS FRONT DOOR**

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

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

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

Each front door window shall include patent pending heated glass technology to reduce fogging with a switch on the dash.

### **GLASS TINT FRONT DOOR**

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

### **GLASS REAR DOOR RH**

The rear right hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **GLASS TINT REAR DOOR RIGHT HAND**

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

### **GLASS REAR DOOR LH**

The rear left hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

### **GLASS TINT REAR DOOR LEFT HAND**

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

### **GLASS SIDE MID RH**

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

### **GLASS TINT SIDE MID RIGHT HAND**

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

### **GLASS SIDE MID LH**

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

### **GLASS TINT SIDE MID LEFT HAND**

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

### **CLIMATE CONTROL**

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

The system shall offer sixteen (16) adjustable louvers. Six (6) of the louvers shall face forward towards the windshield, offering 45,000 BTU of heat at 320 CFM for defrosting. The system shall include six (6) rearward facing louvers to direct air for the crew area and four (4) for driver and officer comfort. The HVAC system shall be designed to produce 60,000 BTU of heat and 32,000 BTU of cooling. The HVAC cover shall be made of aluminum which shall be coated with a customer specified interior paint, or protective coating.

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

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

### **CLIMATE CONTROL DRAIN**

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

### **CLIMATE CONTROL ACTIVATION**

The heating, defrosting and air conditioning controls shall be located on the Vista display and control screen.

### **HVAC OVERHEAD COVER PAINT**

The overhead HVAC cover shall be painted with a Zolatone #20-72 silver gray texture finish.

### **AUXILIARY CLIMATE CONTROL FRONT UNDERSEAT**

Two (2) 13,500 BTU heaters shall be provided and installed in the face of the seat riser storage area for the left and right front seats, one (1) each side. The fan controls shall be located on the Vista display and control screen(s).

The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. The auxiliary heater system shall include one (1) seasonal shut-off valve. The valve shall be supplied at the front of the right hand corner of the cab. The cab must be tilted to access the shut-off valve.

### **A/C CONDENSER LOCATION**

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

### **A/C COMPRESSOR**

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

### **CAB CIRCULATION FANS FRONT**

The cab shall include two (2) all metal 6.00 inch air circulation fans installed overhead in the center of the cab rearward of the windshield. Each fan shall be controlled by an individual toggle switch on each fan. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.

### **UNDER CAB INSULATION**

The underside of the cab tunnel surrounding the engine and the underside of the entire cab floor shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft<sup>2</sup> PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The cab floor insulation shall measure .56 inch thick including a 1.0#/sf PVC barrier and a moisture and heat reflective foil facing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed MVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads. In addition, the insulation on the underside of the cab floor shall have an expanded metal overlay to assist in retaining the insulation tight against the cab.

### **INTERIOR TRIM FLOOR**

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

### **INTERIOR TRIM VINYL**

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

### **REAR WALL INTERIOR TRIM**

The rear wall of the cab shall be trimmed with vinyl.

### **HEADER TRIM**

The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum.

### **TRIM CENTER DASH**

The main center dash area shall be constructed of durable vacuum formed ABS composite.

### **TRIM LH DASH**

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

### **TRIM RH DASH**

The right hand dash trim shall consist of a vacuum formed ABS composite module, which contains a glove compartment with a hinged locking door and a Mobile Data Terminal (MDT) provision. The glove compartment size shall be 13.50 inches wide X 6.25 inches high X 5.50 inches deep. The MDT provision shall be provided above the glove compartment.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **ENGINE TUNNEL TRIM**

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

### **ENGINE TUNNEL ACCESSORIES**

The engine tunnel shall feature a fabricated aluminum console which shall include a large storage bin with dividers and a map compartment. There shall be two (2) cup holders included in the console.

### **POWER POINT DASH MOUNT**

The cab interior shall include four (4) 12 volt cigarette lighter type receptacles in the cab dash to provide a power source for 12 volt electrical equipment. The receptacles shall be wired battery direct.

### **STEP TRIM**

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of polished 5032 H32 aluminum Grip Strut® grating with angled outer corners. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have an opening on the outer edge to allow debris and water to flow through rather than becoming trapped within the stepping surface. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed with a Flex-Tred® adhesive grit surface material.

### **UNDER CAB ACCESS DOOR**

The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior paint with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.

### **INTERIOR DOOR TRIM**

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

### **DOOR TRIM KICKPLATE**

The inner door panels shall include an aluminum tread kick plate which shall be fastened to the lower portion of the door panels.

### **DOOR TRIM SCUFF PLATE**

There shall be stainless steel scuff plate along the door jamb to protect the painted surface from damage should the seat belt buckle come in contact with the door jamb.

In addition, the painted surface rear of the front door windows on the inside of the door shall include a stainless steel scuff plate to protect the painted surface from damage caused by the seat belt buckle.

### **DOOR TRIM CUSTOMER NAMEPLATE**

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

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **CAB DOOR TRIM REFLECTIVE**

The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the rear outer edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes and a Spartan logo. The chevron tape shall measure 6.00 inches in height.

### **INTERIOR GRAB HANDLE "A" PILLAR**

There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each "A" post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.

### **INTERIOR GRAB HANDLE FRONT DOOR**

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

### **INTERIOR GRAB HANDLE REAR DOOR**

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

### **INTERIOR TRIM VINYL COLOR**

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

### **INTERIOR TRIM SUNVISOR**

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

### **INTERIOR ABS TRIM COLOR**

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

### **INTERIOR FLOOR MAT COLOR**

The cab interior floor mat shall be black in color.

### **CAB PAINT INTERIOR DOOR TRIM**

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

### **HEADER TRIM INTERIOR PAINT**

The metal surfaces in the header area shall be coated with Zolatone #20-72 silver gray texture finish.

### **ENGINE TUNNEL ACCESSORIES PAINT**

The engine tunnel accessories shall be painted with Zolatone #20-72 silver gray texture finish.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **DASH PANEL GROUP**

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

### **SWITCHES CENTER PANEL**

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

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

### **SWITCHES LEFT PANEL**

The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel. The switch shall have backlighting provided.

### **SWITCHES RIGHT PANEL**

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

### **SEAT BELT WARNING**

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s), an indicator light in the instrument panel, and an audible alarm.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.

### **SEAT MATERIAL**

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear 1800.

### **SEAT COLOR**

All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts.

### **SEAT BACK LOGO**

The seat back shall include the "Smeal Fire Apparatus Co." logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **SEAT DRIVER**

The driver's seat shall be an H.O. Bostrom Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

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

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

### **SEAT BACK DRIVER**

The driver's seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.

### **SEAT MOUNTING DRIVER**

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

### **OCCUPANT PROTECTION DRIVER**

The driver's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The driver's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.
- Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.
- Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver's lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **SEAT OFFICER**

The officer's seat shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat shall be a non-adjustable type seat.

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

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

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

### **SEAT BACK OFFICER**

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

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

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

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

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

### **SEAT MOUNTING OFFICER**

The officer's seat shall be installed in an ergonomic position in relation to the cab dash.

### **OCCUPANT PROTECTION OFFICER**

The officer's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The officer's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.
- Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

### **SEAT BELT ORIENTATION CREW**

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

### **SEAT REAR FACING OUTER LOCATION**

The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the left side front seat and one (1) located directly behind the right side front seat.

### **SEAT CREW REAR FACING OUTER**

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

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

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

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

### **SEAT BACK REAR FACING OUTER**

The rear facing outboard seat shall feature a Bostrom SecureAll™ self contained breathing apparatus (SCBA) locking system which shall store most U.S. and International SCBA brands and bottle sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

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

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

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

### **SEAT MOUNTING REAR FACING OUTER**

The rear facing outer seats shall offer special mounting positions which shall be 2.00 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats.

### **OCCUPANT PROTECTION RFO**

The rear facing outer seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each rear facing outer seating position APS shall include:

- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

### **SEAT FRAME FORWARD FACING**

The forward facing center seating positions shall include an enclosed seat frame located and installed on the rear wall. The seat frame shall measure 42.38 inches wide X 12.38 inches high X 22.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The seat box shall be painted with the same color as the remaining interior.

### **SEAT FRAME FORWARD FACING STORAGE ACCESS**

There shall be two (2) access points to the seat frame storage area, one (1) on each side of the seat frame. Each access point shall be covered by a hinged door which measures 15.00 inches in width X 10.63 inches in height.

### **CAB FRONT UNDERSEAT STORAGE ACCESS**

The left and right under seat storage areas shall have a vented aluminum hinged door with non-locking latch.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **SEAT COMPARTMENT DOOR FINISH**

All underseat storage compartment access doors shall have a Zolatone #20-72 silver gray texture.

### **WINDSHIELD WIPER SYSTEM**

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

### **ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR**

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

### **CAB DOOR HARDWARE**

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish.

### **DOOR LOCKS**

Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out.

### **GRAB HANDLES**

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

### **REARVIEW MIRRORS**

Retrac Aerodynamic West Coast style dual vision mirror heads model 613305 shall be provided and installed on each of the front cab doors.

The mirrors shall be mounted via 1.00 inch diameter tubular stainless steel arms to provide a rigid mounting to reduce mirror vibration.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an integral convex mirrors installed in the mirror head below the flat glass to provide a wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions.

The mirrors shall be constructed of a vacuum formed chrome plated ABS plastic housing that is corrosion resistant and shall include the finest quality non-glare glass.

### **REARVIEW MIRROR HEAT SWITCH**

The heat for the rearview mirrors shall be controlled through a virtual button on the Vista display and control screen.

### **EXTERIOR TRIM REAR CORNER**

There shall be stainless steel scuff plates on the outside corners at the back of the cab which shall be shipped loose and installed by the OEM. The stainless steel plate shall feature a number seven mirror finish and shall include two sided adhesive tape.

### **CAB FENDER**

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

### **MUD FLAPS FRONT**

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

### **CAB EXTERIOR FRONT & SIDE EMBLEMS**

The cab shall include three (3) Spartan Chassis emblems. There shall be one (1) for the front air intake grille and two (2) emblems with integrated model nameplates for the exterior sides of the cab shipped loose for installation by the body manufacturer.

### **CAB EXTERIOR MODEL NAMEPLATE**

The cab shall include custom "Metro Star Advanced Protection System" nameplates integrated into the side emblem.

### **IGNITION**

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to the left of the steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.

Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the "ON" position.

The starter button shall only operate when both the master battery and ignition switches are in the "ON" position.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **BATTERY**

The single start electrical system shall include six (6) Delco BCI 31 700 CCA batteries with a 180 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541. The cables shall have encapsulated ends with heat shrink and sealant.

### **BATTERY TRAY**

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

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

### **BATTERY BOX COVER**

Each battery box shall include a steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

### **BATTERY CABLE**

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

### **BATTERY JUMPER STUD**

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

### **ALTERNATOR**

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

### **BATTERY CONDITIONER**

A Kussmaul 1200 battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position.

### **BATTERY CONDITIONER DISPLAY**

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

### **AUXILIARY AIR COMPRESSOR**

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

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **ELECTRICAL INLET**

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

### **Amp Draw Reference List:**

*Kussmaul 1000 Charger - 3.5 Amps*

*Kussmaul 1200 Charger - 10 Amps*

*Kussmaul 35/10 Charger - 10 Amps*

*1000W Engine Heater - 8.33 Amps*

*1500W Engine Heater - 12.5 Amps*

*120V Air Compressor - 4.2 Amps*

### **ELECTRICAL INLET LOCATION**

An electrical inlet shall be installed on the left hand side of cab over the wheel well.

### **ELECTRICAL INLET CONNECTION**

The electrical inlet shall be connected to the battery conditioner and the air pump.

### **ELECTRICAL INLET COLOR**

The electrical inlet connection shall include a yellow cover.

### **HEADLIGHTS**

The cab front shall include four (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels.

### **FRONT TURN SIGNALS**

The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable LED amber turn signals which shall be installed in a chrome bezel outboard of the front warning and headlamps.

### **HEADLIGHT LOCATION**

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

### **SIDE TURN/MARKER LIGHTS**

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

### **MARKER AND ICC LIGHTS**

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

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **HEADLIGHT AND MARKER LIGHT ACTIVATION**

The headlights and marker lights shall be controlled via a virtual button on the Vista display. There shall be a virtual dimmer control on the Vista display to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights to 80% brilliance when the battery master switch is in the "On" position and the parking brake is released.

### **GROUND LIGHTS**

Each door shall include an NFPA compliant LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated by the opening of the door on the respective cab side, when the parking brake is set and through a virtual button on the Vista display and control screen.

### **STEP LIGHTS**

The middle step located at each door shall include a recess mounted 4.00 inch round LED light which shall activate with the opening of the respective door.

### **ENGINE COMPARTMENT LIGHT**

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

### **FRONT SCENE LIGHTS**

The front of the cab shall include one (1) Whelen model Pioneer PFA2 contour roof mount scene light installed on the brow of the cab.

The lamp head shall have two (2) 12 volt high intensity LED banks. The lamp head shall draw 6.0 amps and generate 6,000 lumens total. The lamp head will be adjustable up to 20-degrees and shall measure 4.25 inches in height X 14.00 inches in width. The lamp head and brackets shall be powder coated white.

### **FRONT SCENE LIGHTS ACTIVATION**

The front scene lighting shall be activated by a virtual button on the Vista display and control screen.

### **FRONT SCENE LIGHT LOCATION**

There shall be one (1) scene light mounted center on the front brow of the cab.

### **SIDE SCENE LIGHTS**

The side of the cab shall include two (2) Whelen 700 series 70C0ELZR model scene lights, one (1) each side which shall be recess mounted with a chrome bezel. The Whelen lights shall offer LED lighting at a gradient 32-degree angle. The lamps shall draw 2 amps and generate 1,500 lumens.

### **SIDE SCENE LIGHT LOCATION**

The scene lighting located on the left and right sides of the cab shall be mounted rearward of the cab "B" pillar in the 10.00 inch raised roof portion of the cab between the front and rear crew doors.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **SIDE SCENE ACTIVATION**

The scene lights shall be activated by two (2) virtual buttons on the Vista display and control screen(s), one (1) for each light, and by opening the respective side cab doors.

### **INTERIOR OVERHEAD LIGHTS**

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

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

### **MAP LIGHTS**

A Sunnex gooseneck style map light shall be provided. The light shall have a clear bulb and a control switch on the base. The light shall be located on the right hand side of the dash.

### **SPOTLIGHT**

The cab shall include one (1) 12 volt Optronics KB-4003 hand-held spotlight. The spotlight shall provide 400,000 candlepower of illumination and shall include a momentary push button and a coil cord. The spotlight shall be shipped loose with the chassis.

### **DO NOT MOVE APPARATUS LIGHT**

The front headliner of the cab shall include a flashing red light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be 6.00 inches long X 2.50 inches wide X 1.75 inches high and shall be located centered left to right for greatest visibility.

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

### **MASTER WARNING SWITCH**

A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled "E Master" for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the "ON" position when the master switch is activated shall automatically power up.

### **HEADLIGHT FLASHER**

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

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

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **HEADLIGHT FLASHER SWITCH**

The flashing headlights shall be activated through a virtual button on the Vista display and control screen.

### **INBOARD FRONT WARNING LIGHTS**

The cab front fascia shall include two (2) Whelen 600 series Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

### **INBOARD FRONT WARNING LIGHTS COLOR**

The warning lights mounted on the cab front fascia in the inboard positions shall be red with a clear lens.

### **FRONT WARNING SWITCH**

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

### **INTERSECTION WARNING LIGHTS**

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

### **INTERSECTION WARNING LIGHTS COLOR**

The intersection lights shall be red with a clear lens.

### **INTERSECTION WARNING LIGHTS LOCATION**

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

### **SIDE WARNING LIGHTS**

The cab sides shall include two (2) Whelen 600 series Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.

### **SIDE WARNING LIGHTS COLOR**

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

### **SIDE WARNING LIGHTS LOCATION**

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

### **SIDE AND INTERSECTION WARNING SWITCH**

The side warning lights shall be controlled through a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **TANK LEVEL LIGHTS**

There shall be two (2) Whelen PSTANK water level light strips surface mounted vertically, one (1) on each side of the cab behind the rear cab doors.

The light strips shall feature four (4) colors of LED lights to indicate the fluid level of a tank. The colors from top to bottom shall be green, blue, amber, and red.

### **SIREN CONTROL HEAD**

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

### **HORN BUTTON SELECTOR SWITCH**

A virtual button on the Vista display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.

### **AIR HORN ACTIVATION**

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

### **BACK-UP ALARM**

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

### **INSTRUMENTATION**

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

The instrument panel shall contain the following gauges:

One (1) electronic speedometer shall be included. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H.

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

One (1) two-movement gauge displaying primary system, and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI). The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the LCD screen. The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD shall display Transmission Temperature in degrees Fahrenheit on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, fuel level, voltmeter, and an \*indicator bar displaying Diesel Exhaust Fluid (DEF) LED bar shall be included. The scale on the engine oil pressure gauge shall read from 0 to 120 pounds per square inch (PSI). The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the fuel level gauge shall read from empty to full as a percentage of fuel remaining. An amber indicator light shall indicate low fuel at 25% tank level. The scale on the voltmeter shall read from 10 to 16 volts with a red indication zone on the gauge showing critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the DEF LED bar will consist of four (4) LEDs displaying levels in increments of 25% of useable DEF in green. Upon decreasing levels, the indicator bar will change colors to notify the driver of decreasing levels of DEF and action will be required. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an audible alarm.

The instrument panel shall include a light bar that contains the following LED indicator lights and produce the following audible alarms in applicable configurations:

### **RED LAMPS**

Stop Engine-indicates critical engine fault  
Air Filter Restricted-indicates excessive engine air intake restriction  
Park Brake-indicates parking brake is set  
Seat Belt Indicator-indicates when a seat is occupied and corresponding seat belt remains unfastened  
Low Coolant-indicates engine coolant is required

### **AMBER LAMPS**

MIL-indicates an engine emission control system fault  
Check Engine-indicates engine fault  
Check Trans-indicates transmission fault  
High Transmission Temperature-indicates excessive transmission oil temperature  
ABS-indicates anti-lock brake system fault  
HEST-indicates a high exhaust system temperature  
Water in Fuel-indicates presence of water in fuel filter  
\*DPF-indicates a restriction of the diesel particulate filter  
\*Regen Inhibit-indicates regeneration has been postponed due to user interaction  
Range Inhibit-indicates a transmission operation is prevented and requested shift request may not occur.  
\*SRS-indicates a problem in the supplemental restraint system  
Check Message-Turn Signal On  
Check Message-Door Ajar  
Check Message-Cab Ajar  
\*Check Message-ESC Active  
\*Check Message-DPF Regen Active  
Check Message-No Engine Data  
Check Message-No Transmission Data  
Check Message-No ABS Data  
Check Message-No Data All Communication With The Vehicle Systems Has Been Lost  
Check Message-Check Engine Oil Level  
Check Message-Check Washer Fluid Level  
Check Message-Check Power Steering Fluid Level  
Check Message-Low Transmission Fluid Level

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

Check Message-Check Coolant Level

### **GREEN LAMPS**

Left and Right turn signal indicators

\*ATC-indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system

High Idle-indicates engine high idle is active.

Cruise Control-indicates cruise control is active

OK to Pump-indicates the pump engage conditions have been met

Pump Engaged-indicates the pump is currently in use

Auxiliary Brake-indicates secondary braking device is active

### **BLUE LAMP**

High Beam Indicator

### **WHITE LAMP**

Wait to Start-indicates active engine air preheat cycle

### **AUDIBLE ALARMS FROM GAUGE PACKAGE**

High Trans Temp

High or Low Voltage

Check Engine

Check Transmission

Stop Engine

Low Air Pressure

Fuel Low

Water in Fuel

\*ESC

High Coolant Temperature

Low Engine Oil Pressure

Low Coolant Level

\*Low DEF Level

Air Filter Restricted

Extended Left and Right Turn Remaining On

Cab Ajar

Door Ajar

ABS System Fault

Seatbelt Indicator

### **EXTERNAL AUDIBLE ALARM**

Air Filter

Cab Ajar

Door Ajar

Check Engine

Stop Engine

Low Air Pressure

Low Engine Oil Pressure

Water in Fuel

\*Low DEF

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

ABS System Fault  
Seatbelt Indicator

\*Items marked with an asterisk are provided only in applicable configurations.

### **BACKLIGHTING COLOR**

The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.

### **RADIO**

A Panasonic radio with weather band, AM/FM stereo receiver, compact disc player, and four (4) speakers shall be installed in the cab. The radio shall be installed above the driver position. The speakers shall be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers on the upper rear wall of the cab.

### **AM/FM ANTENNA**

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

### **CAMERA**

An Audiovox Voyager heavy duty rearview camera system shall be supplied. One (1) box shaped camera shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle and one (1) camera with a teardrop shaped chrome plated housing shall be mounted on the officer side of the cab below windshield ahead of the front door at approximately the same level as the cab door handle.

The cameras shall be wired to a single Weldon Vista display located on the driver's side dash. The rear camera shall activate when the transmission is placed in reverse and the right camera shall activate with the right side turn signal. Each camera shall also be activated by a button on the Vista display.

### **COMMUNICATION ANTENNA**

An antenna base, for use with an NMO type antenna, shall be mounted on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be an Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be provided by Spartan.

### **COMMUNICATION ANTENNA CABLE ROUTING**

The antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console.

### **AUXILIARY COMMUNICATION ANTENNA**

An auxiliary antenna base, for use with an NMO type antenna, shall be installed on the cab. The antenna base shall be an Antenex model MABVT8 and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be provided by Spartan.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **AUXILIARY COMMUNICATION ANTENNA CABLE ROUTING**

The auxiliary antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console.

### **CAB EXTERIOR PROTECTION**

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

### **FIRE EXTINGUISHER**

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

### **ROAD SAFETY KIT**

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

### **DOOR KEYS**

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

### **DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION**

Diagnostic software for the Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner.

The software has been validated to be compatible with the following RP1210 interface adapters:

- Dearborn Group DPA4 Plus
- Noregon Systems JPRO® DLA+
- Cummins INLINE5
- Cummins INLINE6
- NexIQ™ USB-Link™

The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver's side dash to the left of the steering column.

### **WARRANTY**

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN CHASSIS, INC. LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **CAB AND CHASSIS LABELING LANGUAGE**

The cab and chassis shall include the applicable caution, warning, and notification labels with text to be written in English.

### **CHASSIS OPERATION MANUAL**

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

### **ENGINE AND TRANSMISSION OPERATION MANUALS**

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

- (1) Digital copy of the Engine Owner's manual
- (1) Digital copy of the Transmission Operator's manual
- (1) Hard copy of the Engine Operation and Maintenance manual with CD

### **CAB/CHASSIS AS BUILT WIRING DIAGRAMS**

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

### **CUSTOMER INSPECTION**

There shall be a customer inspection of the chassis at Spartan Chassis in Charlotte, Michigan. The customer, the dealer, or the OEM shall be responsible for all travel costs and arrangements.

The date of the chassis inspection shall be determined based on the requested chassis completion date, OEM production schedules, the chassis off-line date, and the chassis completion date.

The inspection must be coordinated between the OEM/Dealer representative and Andy Torrence the Spartan Chassis FT Auditor/Inspection Coordinator. Andy can be contacted by phone at 517-543-6400 extension 3148, on his cell at 517-231-0959, or by email to [andy.torrence@spartanchassis.com](mailto:andy.torrence@spartanchassis.com).

### **SALES TERMS**

The sale of the Spartan Chassis shall be governed by the terms contained on the Sales Terms – Acceptance of Purchase Order document, a copy of which is attached to this option.

### **OVERALL HEIGHT**

The actual overall height of the vehicle shall be approximately 117" from the ground. This measurement shall be taken with the tires properly inflated with the apparatus in the unloaded condition. The actual measurement shall be taken at the highest point of the apparatus.

### **OVERALL LENGTH**

The actual overall length of the vehicle shall be approximately 408".

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **WHEELBASE**

The actual wheelbase of the vehicle shall be approximately 214".

### **ANGLE OF APPROACH**

The actual angle of approach of the vehicle shall be approximately 9 degrees.

### **ANGLE OF A DEPARTURE**

The actual angle of departure of the vehicle shall be approximately 10 degrees.

### **VEHICLE TOP SPEED**

The apparatus Gross Vehicle Weight Rating (GVWR) is over 26,000 lbs. The vehicle's top speed shall be 68 mph.

### **MISCELLANEOUS EQUIPMENT ALLOWANCE**

The Gross Axle Weight Rating (GAWR) and the Gross Combined Weight Rating (GCWR) or Gross Vehicle Weight Rating (GVWR) of the chassis shall be adequate to carry the weight of the unequipped apparatus with the water tank and other tanks full, specified hose load, unequipped personnel weight, ground ladders, and miscellaneous equipment allowance of 2,000 pounds.

### **MISCELLANEOUS EQUIPMENT**

Miscellaneous equipment, as defined by NFPA 1901, sections 5.8.2 and 5.8.3, shall be the responsibility of the customer. The apparatus shall be designed and manufactured in such a manner as to provide ample enclosed space for which to store such equipment.

### **OWNER'S MANUAL**

There shall be an owner's manual containing the construction, operation, and service documentation provided on a USB Drive. There shall be one (1) copy of the USB provided with the apparatus.

### **ELECTRICAL MANUAL**

A complete electrical manual for the apparatus shall also be provided on the USB Drive. This manual shall be specifically prepared for this individual unit rather than a generic schematic manual designed to accommodate all apparatus. The electrical manual shall also include electrical schematics, harness layouts, V-Mux specifications (including Node Input/output Spreadsheet and Node Relationship Spreadsheet), and Master Wire Listing. A contact letter shall also be provided by the electrical engineer, who built the manual, with instructions on using the manual and contact information for assistance with electrical manual questions.

### **ELECTRICAL SCHEMATICS**

There shall be a section of the electrical manual that shall include schematics of the electrical system and components on the apparatus. These schematics shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **PUMP PLUMBING SCHEMATICS** (if applicable)

There shall be a section of the electrical manual that shall include a schematic of the pump plumbing. This schematic shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.

### **HYDRAULIC SCHEMATICS** (if applicable)

There shall be a section of the electrical manual that shall include schematics of the hydraulic components on the apparatus including but not limited to:

- Ladder Rack(s) and Hose Bed Door(s) (if applicable)
- Aerial – Retraction/Extension (if applicable)
- Aerial – Rotation (if applicable)
- Tiller – HVAC Hydraulics System (if applicable)

### **PRE-CONSTRUCTION MEETING**

There shall be a pre-construction meeting held at a location agreed upon between department officials and the dealership. The pre-construction meeting is the most important meeting during the after-sale production process. The purpose of this meeting is to finalize all aspects of the specifications, discuss and clarify all design details of the apparatus and to share or provide all information so all parties are in agreement on the apparatus being constructed. The ultimate goal of the pre-construction meeting is for the purchaser and dealer representative(s) to discuss and clarify all aspects of the proposed apparatus and to provide all necessary information to the apparatus manufacturer that shall ensure the apparatus is built to the satisfaction of all parties involved.

The apparatus manufacturer shall create and forward to the dealer a "Pre-construction" document containing the following items:

- Complete specifications of the apparatus including the chassis
- Detailed amp draw report
- Listing of clarifications or questions from the manufacturer that require attention (shelf locations, lettering details, etc.)
- Minimum of five (5) full size "C" drawings
- 11" x 17" drawing

During this pre-construction meeting, any changes or clarifications must be documented on a manufacturer issued change order. The change order shall be signed by the customer and dealership and ultimately by the apparatus manufacturer. The change order becomes an extension of the contract with the official signatures of all three parties. All change order items resulting from the pre-construction meeting shall be implemented into the official shop order document.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **FINAL INSPECTION**

The customer and/or dealer representative will inspect the final apparatus prior to it leaving the apparatus body manufacturer's facility. This will allow any changes that may be required, to be done so in a timely and inexpensive manner. After leaving the facility, all repairs or alterations will be performed by either the Dealer or an OEM approved service center.

### **INSPECTION CERTIFICATE - NFPA 1901 COMPLIANCE**

A third party inspection certificate for the apparatus shall be furnished upon delivery. The purpose of this NFPA 1901 compliance inspection shall be to serve as proof to the customer that all applicable standards have been met or exceeded by the responsible manufacturer.

The following objectives shall be achieved as a result (this listing shall not be construed as being all inclusive):

- Ensure that understanding of all parties respective responsibilities have been addressed by the actual referencing of NFPA 1901 and the amendments in these specifications and the purchase contract and documentation.
- Ensure that only structural materials complying with appropriate standards and codes are used for construction.
- Ensure that applicable standards of design and manufacturing have been met or exceeded.
- Ensure that safety factors have been met or exceeded where required.
- Ensure that applicable standards for testing and inspection have been met or exceeded by personnel with the appropriate qualifications, experience, and certifications.
- Ensure that where applicable components, equipment, and loose equipment carry the appropriate characteristics, classifications, and/or certifications.
- Ensure that in general and as a whole, all applicable requirements set forth in NFPA 1901, and those codes, standards, and specifications referenced by said parties are met, exceeded, and/or addressed.

### **INDEPENDENT THIRD PARTY PUMP CERTIFICATION**

The fire pump shall be tested and certified by Underwriter's Laboratories, a nationally recognized independent third party testing company. Tests shall be conducted so that the pump performs as listed below:

- 100% of rated capacity at 150 pounds net pressure
- 70% of rated capacity at 200 pounds net pressure
- 50% of rated capacity at 250 pounds net pressure
- 100% of rated capacity at 165 pounds net pressure

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by NFPA 1901. The pump shall be free from objectionable pulsation and vibration.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **PUMP CERTIFICATION**

The pump shall be certified in U.S. gallons per minute (GPM).

### **12 VOLT SYSTEMS TEST**

After completion of the unit, the 12 volt electrical system shall undergo a battery of tests as listed in NFPA 1901. These tests shall include, but not be limited to:

- Reserve capacity test
- Alternator performance test at idle
- Alternator performance test at full load
- Low voltage alarm test

Certification of the results shall be supplied with the apparatus at the time of delivery.

### **TILT TABLE TESTING**

The apparatus shall be tested to verify the stability to 26.5 degrees in both directions. The apparatus shall be tested while loaded with fuel, fire fighting agents, hose, ladders, weight of 250 lbs. per seat, and also weight that is equivalent to the miscellaneous equipment that shall be carried. The weight added to the apparatus for testing purposes shall be distributed approximately to the in-service use, yet not to exceed the manufacturer's compartment ratings.

### **VEHICLE STABILITY**

The apparatus shall comply with the requirements of NFPA 1901 as it applies to vehicle stability. The particular apparatus as described in the specification provided within the bid package shall be classified into one of the following categories:

- The apparatus shall go through actual tilt table testing. This shall be determined by the apparatus manufacturer.
- The apparatus shall be equipped with a rollover stability control system as defined in section 4.13.1.2 of NFPA 1901.
- The apparatus shall be deemed a similar apparatus and meeting the intent of section 4.13.1.1.2 of NFPA 1901.

### **TEN (10) YEAR WARRANTY BODY STRUCTURAL INTEGRITY**

The body shall be free of structural or design failure or workmanship for a period of ten (10) years or 100,000 miles starting thirty (30) days after the original invoice date.

### **THREE (3) YEAR PAINT LIMITED WARRANTY**

The apparatus body and pump house shall be free of blistering, peeling and any other adhesion defect caused by defective manufacturing methods or paint material selection for exterior surfaces for a prorated period of three (3) years starting thirty (30) days after the original invoice date.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

Paint on the undercarriage, body interior (Line-X® coating included) or aerial structure related paint, if applicable, is covered only under the Standard One (1) Year Limited Warranty.

### **TEN (10) YEAR CORROSION LIMITED WARRANTY**

The body exterior paint shall be warranted against corrosion perforation for a prorated period of ten (10) years starting thirty (30) days after the original invoice date.

### **TEN (10) YEAR STAINLESS STEEL PLUMBING LIMITED WARRANTY**

The stainless steel plumbing and piping shall be free from corrosion perforation for a period of ten (10) years starting thirty (30) days after the original invoice date.

### **PUMP WARRANTY**

The fire pump shall be warranted by Waterous for a period of five (5) years from the date of delivery to the fire department or five and one-half (5-1/2) years from the shipment date by Waterous, whichever period shall be first to expire.

### **WATER TANK WARRANTY**

The tank shall be complete with a lifetime warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty.

### **TWENTY (20) YEAR GALVANIZED SUBFRAME WARRANTY**

The galvanized subframe shall be free of structural or design failure or workmanship for a period of twenty (20) years starting thirty (30) days after the original invoice date.

### **ONE (1) YEAR BASIC LIMITED PARTS & LABOR WARRANTY - OEM FABRICATED PARTS**

OEM fabricated parts shall be free of defects in material and workmanship for a period of one (1) year starting thirty (30) days after the original invoice date.

### **SPARTAN METRO STAR CHASSIS**

The chassis shall be a Spartan Metro Star.

### **MUD FLAPS**

In addition to the chassis supplied front mud flaps, there shall be two (2) mud flaps provided rearward of the rear axles on the apparatus. The mud flaps shall be a minimum of 3/8" thick to prevent "sailing."

### **CHASSIS SUPPLIED EJECT**

The charger eject shall be supplied and installed by the chassis manufacturer.

### **CHASSIS SUPPLIED SWITCH PANEL**

The switch panel shall be supplied and installed by the chassis manufacturer.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **EMS COMPARTMENT**

There shall be an EMS compartment installed on the back wall in the chassis cab. The compartment shall be constructed of aluminum. There shall be three (3) adjustable shelves provided in the compartment.

The compartment shall have a roll up door provided on the front for easy access to equipment stored inside. The roll up door shall be supplied with a full width handle for ease of opening with only one hand, allowing quick access to equipment and nylon end shoes on every slat to assure operation without constant lubrication. There shall be a door lock with key provided with the roll up type door.

The EMS compartment shall be furnished with a LED compartment light mounted on the front corner of the compartment. An automatic door switch shall activate the compartment light.

The component shall be painted with a gray Zolatone™ finish to match the interior of the chassis cab.

### **HELMET BRACKETS, ZICO**

The apparatus manufacturer shall supply four (4) helmet brackets in the chassis cab.

The brackets shall meet the 9G requirements of NFPA 1901. The Zico model UHH-1 brackets shall hold both traditional and contemporary style helmets without any adjustments necessary. Storing and removing a helmet that is on the bracket is quick and easy.

The receptacle shall be located on the back of the engine tunnel, inside the chassis cab.

### **RECEPTACLE OUTLET BAR**

There shall be one (1) 120 volt receptacle outlet bar installed on the apparatus. The outlet bar shall have six (6) 120 volt receptacles and wired directly to the shoreline.

### **CHASSIS SUPPLIED FRONT BUMPER**

The front bumper shall be chassis supplied and installed.

### **SCREAMING EAGLE C9-11-P SIREN**

There shall be a Screaming Eagle model C9-11-P chromed electro/mechanical, coaster type siren installed. The siren shall be pedestal mounted on the front bumper apron. The weight of the siren shall be 24 pounds and shall be 9" high x 7" in diameter x 14" long. The siren shall draw 37 operational amps and shall produce a focused sound level of 123 decibels. The siren on/off switch shall be located in the apparatus cab and shall be wired in such a manner that when the switch is placed in the off position the siren brake shall automatically be engaged.

The component shall be pedestal mounted on the right outboard side of the extended bumper gravel shield.

The siren shall be controlled by two (2) foot switches, one on the driver's side floor on an angled mounting bracket and one (1) on the officer's side floor on an angled mounting bracket.

### **CHASSIS SUPPLIED SIREN**

The siren shall be supplied and installed by the chassis manufacturer.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **CHASSIS SUPPLIED SPEAKER(S)**

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

### **MIDSHIP MOUNT FIRE PUMP**

The fire pump shall be a Waterous CSUC20 1500 U.S. GPM (5678 LPM) single-stage midship mount pump.

*Shop Note: The pump shall provide the proper right side inlet for future front suction.*

### **PUMP TRANSMISSION**

The pump shall have a Waterous model C20 series transmission. The housing of the transmission shall be constructed of high strength, three piece, horizontally split aluminum. The drive line shafts shall be made from alloy steel forgings, hardened and ground to a size 2.350 inch 46 tooth involute spline. The drive and driven sprockets shall be made of steel and shall be hardened and have ground bores. The drive chain shall be a Morse HV™ high strength involute form chain. Bearings shall be deep groove, anti friction ball bearings and shall give support and proper alignment to the impeller shaft assembly. Bearings shall be oil splash lubricated, completely separated from the water being pumped, and protected by a V-ring and oil seal. An internal lubrication system shall deliver lubricant directly to the drive chain. This unique design eliminates the need for an external lubrication pump and auxiliary cooling. The pump and transmission shall be easily separable. A two-piece shaft shall be splined allowing for individual repair of either the pump or transmission, to keep down time to a minimum. All drive line components shall have a torque rating equal to or greater than the final net engine torque.

### **SINGLE STAGE FIRE PUMP**

The pump shall be a single stage centrifugal class "A" rated fire pump, designed specifically for the fire service.

The pump shall be rated at 1500 gallons per minute.

### **PUMP BODY**

The pump body shall be cast as two (2) horizontally split pieces. The body shall be made of high tensile, close-grained gray iron with a minimum tensile strength of 40,000 PSI.

### **FIRE PUMP MOUNTING**

The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body.

The pump shall be frame mounted; therefore minimizing the likelihood of the pump casing cracking should the apparatus be involved in a collision.

The pump module shall be mounted to the frame in four (4) locations and shall be reinforced appropriately in order to carry the expected load for the life of the apparatus.

### **PAINT PUMP GRAY/PAINT STEAMER AND INLET VALVES PRIMARY BODY COLOR**

The pump body shall be painted with PPG polyurethane enamel paint. The paint color shall be a neutral gray. The pump enclosure shall be painted the same color as the apparatus body.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The steamer and partially recessed inlet valves shall be painted with a PPG polyurethane enamel paint. The paint color shall be the same as the apparatus body.

### **ZINC ANODES**

There shall be four (4) Waterous zinc anodes provided with the fire pump. The anodes shall aid in preventing galvanic corrosion within the water pump and be easily replaceable. The anodes shall be installed as follows:

- Two (2) on the intake side of the pump
- Two (2) in the discharge manifold of the fire pump.

### **FLAME PLATED IMPELLER HUBS**

The pump impellers shall be bronze, specifically designed for the fire service and accurately balanced for vibration free running. The stripping edges shall be located on opposite sides of the impellers to reduce shaft deflection.

The impeller shaft shall be stainless steel, accurately ground to size and supported at each end by oil or grease lubricated anti-friction ball bearings for rigid, precise support. The bearings used on the impeller shaft shall be automotive type bearings, easily cross-referenced and readily available at normal parts or bearing outlets.

The impeller hubs shall be flame plated with tungsten carbide to hardness approximately twice that of tool steel to assure maximum pump life and efficiency. During the flame plating process the base metal shall not be allowed to exceed a temperature of 300 degrees Fahrenheit to prevent altering the metallurgical properties of the impeller material.

### **WATEROUS IMPELLER WEAR RINGS**

The pump shall be equipped with replaceable bronze wear rings for increased pump life and minimum maintenance cost. The wear rings shall be designed to fit into a groove in the face of the impeller hubs forming a labyrinth that, as the clearance increases with age, directs water from the discharge side in several directions eventually exiting outward, away from the eye of the impeller hub.

### **PUMP PACKINGS**

The stuffing boxes shall be equipped with Waterous Grafoil® two-piece adjustable packing glands.

### **ELECTRIC OVER AIR PUMP SHIFT**

The pump shift shall be supplied and installed by the chassis manufacturer.

The pump system shift indicator lights in the chassis cab shall be supplied and installed by the chassis manufacturer.

The pump system shift indicator lights on the operator's panel shall be incorporated with the pump pressure governor.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **TRIDENT PRIMING PUMP**

The priming pump shall be a Trident Emergency Products, model 31.001.7 three barrel, compressed air powered, high efficiency, multi-stage, venturi based AirPrime™ System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. There shall be a pressure protection valve installed with the priming pump. A single panel mounted control shall activate the priming pump and open the priming valve to the pump.

### **PRESSURE GOVERNOR**

The apparatus shall be equipped with a Class 1, model 117690 Total Pressure Governor (TPG) that is connected to the engine Electronic Control Module. The TPG shall operate as a pressure sensor (regulating) governor (PSG) utilizing the engines J1939 data for optimal resolution and response. Programmable presets for RPM and pressure settings shall be easily configurable using the TPG's straightforward menu structure. The TPG shall also include indication of engine RPM, system voltage, engine oil pressure and engine temperature with audible alarm output for all. The TPG uses the J1939 data bus for engine information requiring no additional sensors to be installed.

The TPG shall also include a pump hour meter to track total hours of pump operation.

### **ENGINE INFORMATION DISPLAY**

There shall be one (1) Class 1 ENFO IV Engine Information Display installed on the pump operator's panel. The ENFO IV shall display engine RPM, engine oil pressure, engine coolant temperature, and voltage. The ENFO IV shall use the SAE J-1939 data bus for its information and shall not require any additional sensors to be mounted. An external alarm shall activate when oil pressure is 10 PSI or less, engine temperature is 250° F or higher, or voltage is 11.9V or less. During a low voltage or low oil pressure condition the corresponding display shall alternate between the current value and "LO". During a high temperature condition the engine temp display shall alternate between the temperature and "HI".

### **INTAKE RELIEF VALVE**

There shall be an Elkhart Brass intake relief valve installed on the suction side of the pump. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2" male NST connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".

### **MASTER DRAIN VALVE**

A Trident manifold drain valve assembly shall be supplied. This drain shall provide the capability to drain the entire pump by turning a single control. The valve assembly shall consist of a stainless steel plate and shaft in a bronze body with multiple ports. The drain valve control shall be mounted on the left side pump panel and labeled "Master Drain".

### **WATEROUS PUMP LUBRICATION SYSTEM**

An internal lubrication system shall deliver lubricant directly to the drive chain. This unique design shall eliminate the need for an external lubrication pump and auxiliary cooling. Oil shall be supplied with the lubrication system.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **PUMP AND ENGINE COOLING SYSTEM**

There shall be a pump and engine cooling system provided on the apparatus. The cooling system shall keep the engine cool when running for long periods of time and the pump cool during long periods of pumping when water is not being discharged. The cooling system shall also be setup in a way that the cooling system lines can be easily drained through the master pump drain.

The cooling system lines shall consist of high-pressure, high-temperature 3/8" (inside diameter) abraded rubber hose. The engine cooling lines shall be installed with one (1) line going from the discharge side of the water pump through a Class 1, model 38BV, quarter turn ball valve and continuing on to the chassis heat exchanger. The return line from the heat exchanger shall then run into the suction side of the pump. The pump cooling lines shall be installed with one (1) line going from the discharge side of the water pump through a Class 1, model 38BV, quarter-turn ball valve up to the water tank. At the water tank, the pump cooling line shall be plumbed into a 3/8" check valve on the "Tank Fill" valve. The check valve shall prevent tank water from back flowing into the pump when the cooling system is not in use. A return line from the water tank shall be plumbed into the water pump.

The engine cooling system valve shall be controlled on the operators panel, and shall be clearly labeled, "Engine Cooler".

The pump cooling system valve shall be controlled on operators panel, and shall be clearly labeled, "Pump Cooler".

### **ENGINEERING FOR FUTURE FOAM SYSTEM**

The stainless manifold on the pump shall be engineered for the future installation of a future foam system. In addition to the plumbing, the pump operators control panel shall also be engineered for installation of foam controls. A cover plate shall be provided on the pump panel in the area set aside for the foam controls.

### **PLUMBING MANIFOLD**

The plumbing manifold shall consist of a two (2) part assembly that includes the inlet side manifold and the discharge side manifold. Galvanized Victaulic couplings shall be used wherever possible for ease of maintenance and superior corrosion protection.

The inlet side of the plumbing manifold shall utilize schedule 10, 304 grade stainless steel tubing and preformed elbows for inlets that are larger than 3". Side auxiliary inlets that are 3" or smaller shall utilize schedule 40, 304 grade stainless steel tubing and preformed elbows. The inlet manifold shall thread into the pump auxiliary inlet ports and each inlet valve shall thread onto the inlet manifold.

The discharge side of the plumbing manifold shall utilize schedule 10, 304 grade stainless steel tubing and preformed elbows. The discharge manifold shall connect to the pump discharge ports using 1/2" stainless steel flanges that shall be machined to seat an O-ring to ensure a leak proof seal. Each discharge shall derive from a port on the manifold assembly connected to a discharge valve with 1/2" 304 grade stainless steel flanges. Discharges that terminate in a location other than the pump module (i.e. rear discharges) shall utilize a combination of high pressure flex hose and schedule 10, 304 grade stainless steel tubing to allow flexibility between the body and the pump module.

There shall be a Trident Emergency Products 3/4" quarter turn drain valve included. There shall be a chrome plated rectangular handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

### **4" TANK-TO-PUMP**

There shall be a 4" tank-to-pump plumbed with a Class 1 flexible hose from the tank to the suction side of the pump.

An Akron Brass model 8830 3" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall also include a necessary B3-SH pump flange adapter, which shall be specifically used for the tank-to-pump line to properly adjust the plumbing based on the pitch of the pump. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a check valve between the pump suction and the booster tank valve. The check valve shall eliminate back flow into the water tank when the pump is connected to a pressurized source.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **2" TANK FILL**

There shall be a 2" tank fill plumbed from the pump to the tank. Installation shall be completed with 2" Class 1 rubber hose and stainless steel hose couplings.

An Akron Brass model 8820 2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **6" LEFT SIDE STEAMER INLET**

There shall be a 6" steamer inlet located on the left side of the pump module. The suction fittings shall include a removable die-cast screen to provide cathodic protection for the pump thus reducing corrosion.

A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width.

The intake shall terminate MNST thread.

There shall be one (1) South Park model LHC26P14AC, 6" NST long handle steamer cap provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a chrome color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **6" RIGHT SIDE STEAMER INLET**

There shall be a 6" steamer inlet located on the right side of the pump module. The suction fittings shall include a removable die-cast screen to provide cathodic protection for the pump thus reducing corrosion.

A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width.

The intake shall terminate MNST thread.

There shall be one (1) South Park model LHC26P14AC, 6" NST long handle steamer cap provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a chrome color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **2-1/2" LEFT SIDE INLET**

There shall be a 2-1/2" gated inlet, with 2-1/2" plumbing, provided on the left side of the pump module. The inlet shall be located towards the rear of the pump module and shall be fully recessed behind the panel in order to keep the valve protected from the elements.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

An Akron Brass model 8825 2-1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Trident Emergency Products 3/4" quarter-turn drain valve included. There shall be a chrome plated rectangular handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

The intake shall terminate FNST thread.

There shall be one (1) South Park model HPC3008AC, 2 1/2" NST plug with chain provided. The plug shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **2-1/2" LEFT SIDE DISCHARGE**

There shall be a 2-1/2" discharge, with 2-1/2" plumbing, located on the left side of the pump module.

An Akron Brass model 8825 2-1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area.

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## Top-Mount Rescue Pumper Specifications

The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

The discharge shall terminate MNST thread.

There shall be one (1) South Park model SE394505AC, 2-1/2" Female NST swivel rocker lug x 2-1/2" Male NST 45° elbow adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be one (1) South Park model HCC2808AC, 2-1/2" NST vented rocker lug cap with chain provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a red color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **2-1/2" LEFT SIDE DISCHARGE**

There shall be a 2-1/2" discharge, with 2-1/2" plumbing, located on the left side of the pump module.

An Akron Brass model 8825 2-1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The discharge shall terminate MNST thread.

There shall be one (1) South Park model SE394505AC, 2-1/2" Female NST swivel rocker lug x 2-1/2" Male NST 45° elbow adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be one (1) South Park model HCC2808AC, 2-1/2" NST vented rocker lug cap with chain provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a blue color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **2-1/2" RIGHT SIDE DISCHARGE**

There shall be a 2-1/2" discharge, with 2-1/2" plumbing, located on the right side of the pump module.

An Akron Brass model 8825 2-1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

The discharge shall terminate MNST thread.

There shall be one (1) South Park model SE394505AC, 2-1/2" Female NST swivel rocker lug x 2-1/2" Male NST 45° elbow adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

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## Top-Mount Rescue Pumper Specifications

There shall be one (1) South Park model HCC2808AC, 2-1/2" NST vented rocker lug cap with chain provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and an orange color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **4" RIGHT SIDE DISCHARGE**

There shall be a 4" large diameter discharge, with 4" plumbing, located on the right side of the pump module.

An Akron Brass model 8830 3" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve. The actuator shall include an Akron Brass model 7875 Slo-Cloz™ to control the opening and closing speed of the valve to minimize the effects of water hammer.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be an Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

The discharge shall terminate MNST thread.

There shall be one (1) Kochek model CB504-1, 5" NH vented rocker lug cap with chain provided. The cap shall have a chrome finish.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a dark green color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **1-1/2" CROSSLAY PRE-CONNECT**

There shall be a 1-1/2" crosslay pre-connect with 2" plumbing.

The discharge shall be foam capable.

An Akron Brass model 8820 2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

The discharge shall terminate MNST thread.

The discharge shall be designated as a pre-connect and no cap and chain shall be supplied.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a yellow color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **1-1/2" CROSSLAY PRE-CONNECT**

There shall be a 1-1/2" crosslay pre-connect with 2" plumbing.

The discharge shall be foam capable.

An Akron Brass model 8820 2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

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## Top-Mount Rescue Pumper Specifications

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

The discharge shall terminate MNST thread.

The discharge shall be designated as a pre-connect and no cap and chain shall be supplied.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a white color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

### **2-1/2" FRONT BUMPER DISCHARGE**

There shall be a 2-1/2" discharge located above the gravel shield on the left side of the front bumper. The discharge shall be plumbed with 2-1/2" plumbing and high pressure flex hose with stainless steel couplings.

The discharge shall have Class1 model 34AD automatic drains installed in the low routed areas below the 1/4 turn manual drain. The automatic drains shall open whenever pressure in the line drops below 6 psi.

An Akron Brass model 8825 2-1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

The discharge shall terminate MNST thread.

The discharge shall be designated as a pre-connect and no cap and chain shall be supplied.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **2-1/2" LEFT REAR DISCHARGE**

There shall be a 2-1/2" discharge, with 2-1/2" plumbing, located on the left rear of the apparatus.

The discharge shall be foam capable.

An Akron Brass model 8825 2-1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

The discharge shall terminate MNST thread.

There shall be one (1) South Park model SE394505AC, 2-1/2" Female NST swivel rocker lug x 2-1/2" Male NST 45° elbow adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be one (1) South Park model HCC2808AC, 2-1/2" NST vented rocker lug cap with chain provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a brown color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **3" DELUGE RISER DISCHARGE**

There shall be a 3" discharge for the deluge located above the pump module. The discharge shall be centered in the pump module.

An Akron Brass model 8830 3" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass model R1 manual actuator installed on the valve. The actuator shall include an Akron Brass model 7875 Slo-Cloz™ to control the opening and closing speed of the valve to minimize the effects of water hammer.

The manual actuator shall be controlled by a zinc plated control rod with a black tapered handle at the top mount control panel. The centerline of the valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.

There shall be a Innovative Controls 3/4" quarter turn drain valve included. There shall be a side stem, long stroke lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

There shall be a Thuemling 2-1/2" water pressure gauge installed. The pressure gauge shall read pressure in PSI and be shall capable of reading 0-400 PSI. The gauge shall be fully filled with pulse and vibration dampening liquid to insure proper operations to minus 40 degrees and to reduce lens condensation. A removable polished, stainless steel trim ring shall be provided with the gauge. The gauge shall utilize a red LED light for back lighting.

### **DECK GUN RISER PIPE**

The riser for the deck gun shall terminate with a 3" Victaulic coupling.

### **TFT 18" MANUAL EXTEND-A-GUN - XG18VL-PL**

A Task Force Tips manual Extend-A-Gun model XG18VL-PL shall be supplied. The Extend-A-Gun shall allow for an 18" extension of the waterway for the monitor by lifting a quick release and raising or lowering the non-rotating pipe into a locked position. The extension shall have a 3" waterway, a hard-coat anodized finish, and built in sensors for connection to the open door alarm.

*Shop Note: The overall height must not exceed 117" with an Akron Apollo monitor installed.*

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a magenta color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **WATER TANK**

The apparatus shall be equipped with a United Plastic Fabricating 1000 U.S. gallon rectangular water tank. Certification of the tank capacity shall be recorded on the manufacturer's record of construction and shall be provided to the purchaser upon delivery of the apparatus. The UPF® water tank shall be constructed of 1/2" thick PT2E™ polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermoplastic, black in color, and U.V. stabilized for maximum protection.

### **BOOSTER TANK**

The booster tank shall be of a specific configuration and shall be so designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal.

### **TANK BAFFLES**

The transverse swash partitions shall be manufactured of 3/8" PT2E™ polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" PT2E polypropylene (natural in color) and extend to the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions shall interlock with one another and be welded to each other as well as to the walls of the tank.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **TANK SUMP**

There shall be one (1) sump in the bottom of the water tank. The sump shall be constructed of 1/2" polypropylene and shall be located in the left front quarter of the tank. On all tanks that require a front suction, a 4" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 2" above the sump to pre-vent air from being entrained in the water while pumping.

### **TANK FILL CONNECTION**

All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and shall be capable of withstanding sustained fill rates of up to 1,000 GPM.

### **TANK LID**

The tank lid shall be constructed of 1/2" thick PT2E™ polypropylene to incorporate a multi three-piece locking design that allows for individual removal and inspection if necessary. The tank lid shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the lids shall have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and shall assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2" x 13" to accommodate the lifting eyes.

### **WATER TANK MOUNTING**

The water tank cradle shall be an integral part of the body sub-frame. Please reference the sub-frame section for complete water tank mounting information.

### **WATER TANK DRAIN**

There shall be a 1-1/2" drain valve provided under the sump of the water tank. The valve shall include a locking lever to prevent accidental draining of the water tank.

### **4" WATER TANK SLEEVES**

The United Plastic Fabricating water tank shall contain the appropriate number of 4" tank sleeves for plumbing to the rear of the apparatus.

### **6" WATER TANK SLEEVES**

The United Plastic Fabricating water tank shall contain the appropriate number of 6" tank sleeves for plumbing to the rear of the apparatus.

### **WATER TANK FILL TOWER**

The tank shall have a combination vent and manual fill tower marked "Water Fill." The fill tower shall be constructed of 1/2" PT2E™ polypropylene and shall be a minimum dimension of 8" x 8" at the outer perimeter. The tower shall be located in the left front corner of the tank. The tower shall have a 1/4" thick removable polypropylene screen and a PT2E™ polypropylene hinged-type cover. The fill tower shall be blue in color.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **6" WATER TANK OVERFLOW**

The tank shall be equipped with a minimum of a 6" schedule 40 polypropylene overflow/air vent pipe. The pipe shall be installed in the fill tower and extend through the tank and dump to the rear of the rear axle.

### **WATER TANK LEVEL GAUGE**

There shall be one (1) Class 1 Intelli-Tank™ water tank level gauge provided on the pump operator's control panel. The water tank level gauge shall indicate the water level on an easy to read LED display and show increments of 1/8 of a tank. The water tank level gauge shall include:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area.
- A super bright LED 4-light display with a visual indication at nine accurate levels.
- A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power.

### **WATER TANK LEVEL DISPLAYS**

There shall be a four (4) LED light water level display installed on the left and right side of the chassis cab by the chassis manufacturer.

The apparatus manufacturer shall install a Class 1 driver module to power the four (4) light displays. The module shall receive data from the master water tank level gauge and mimic the master display.

The color of the LED lights shall be green, blue, amber and red.

### **FOAM CELL**

There shall be one (1) United Plastic Fabricating 25 U.S. gallon foam cell incorporated into the water tank. There shall be one (1) pressure/vacuum vent installed on the foam tank. There shall be one (1) drain hose connected to the foam cell. The drain shall have a quarter-turn valve installed inside the pump module and it shall drain below the frame rail of the chassis. The fill tower on the foam cell shall be green in color.

The foam tank shall have a manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. Each foam fill tower shall be constructed of a green colored material indicating which tower is to receive each type of foam utilized. The capacity of the tank shall be engraved on the top of the fill tower lid. The tower shall be located in the right front corner of the tank unless otherwise specified. The tower shall have a 1/4" thick removable polypropylene screen and a stainless steel hinged-type cover. Inside the fill tower, approximately 1.5" down from the top, there shall be an anti-foam fill tube that extends down to the bottom of the tank. A pressure vacuum vent shall be provided in the lid of the fill tower.

Class "A" foam shall be utilized.

### **FOAM TANK LEVEL GAUGE**

There shall be one (1) Class 1 Intelli-Tank™ class A foam tank level gauge. The gauge shall be located on the pump operator's control panel and shall have a label that indicates it is for the foam cell that contains the class A foam. The gauge shall indicate the foam level on an easy to read LED display and show increments of 1/8 of a tank.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The foam tank level gauge system shall include the following:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area. Sealed foam tanks will require zero pressure vacuum vents.
- A super bright LED 4-light display with a visual indication at nine accurate levels.
- A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power.

### **2-1/2" REAR DIRECT TANK FILL**

There shall be a one (1) 2-1/2" direct tank fill located on the right-rear of the apparatus. The tank fill shall be complete with a 3/4" Male NPT bleeder valve to provide relief on pressurized lines.

There shall be one (1) 2-1/2" Fireman's Friend internally mounted tank fill valve provided on the apparatus. The valve shall be capable of flowing at a rate in excess of 1000 GPM. The valve shall have a self-deflecting design that does not require any additional diffusion device. The valve shall be constructed of stainless steel, with a spring actuated piston-type sealing mechanism. The valve seal shall be designed to be self-cleaning, utilizing EPDM rubber. The valve shall terminate with a 2-1/2" NST female chrome swivel.

There shall be a 3/4" Male NPT bleeder valve on the underside of the valve body to provide relief on pressurized lines.

There shall be one (1) South Park model SE394505AC, 2-1/2" Female NST swivel rocker lug x 2-1/2" Male NST 45° elbow adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be one (1) South Park model HPC3008AC, 2 1/2" NST plug with chain provided with the tank fill. The plug shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

### **INDEPENDENT STAINLESS STEEL PUMP MODULE**

The pump module shall be fabricated from 12 gauge 409 stainless steel. The module shall be fabricated as individual unit independent from the body. The module shall be fabricated utilizing the break and bend technique in order to form a strong, yet flexible, structure. The pump module shall be constructed utilizing precision holding fixtures to ensure proper dimensioning and all attachment points shall be heavily reinforced.

### **PUMP MODULE LIGHTS**

The pump module shall be equipped with two (2), 9" On-Scene Night Axe LED compartment lights. The lights shall be rated at 100,000 hours of service. The light shall be waterproof and magnesium chloride resistant. The light shall be enclosed in tough 5/8" Lexan tube. Multi-clip attachments shall allow for easy installation.

### **PUMP COMPARTMENT HEAT PAN**

There shall be a heat pan with a slide-in bottom panel installed beneath the pump compartment to contain the engine heat and prevent freezing of valves and plumbing in cold weather. The lower portion of the pump compartment area shall be enclosed on all sides, front, and rear. The slide-in panel shall be easily removable for warm weather operations.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The slide-in panel and housing shall be constructed out of aluminum.

### **40,000 BTU PUMP MODULE HEATER**

There shall be a 40,000 BTU marine grade heater installed in the pump module. The heater meets Coast Guard requirements for ignition protection and all hardware is marine grade.

The heater shall have an electric fan to circulate the heat throughout the pump module. The heating coil shall be connected to the engine cooling circuit with 5/8" heater hose and there shall be valves located in the engine compartment in order to turn off the flow to the heater in the event of hose failure.

There shall be a switch located on the pump operators control panel to turn the pump compartment heater fan on or off. In addition, an indicator light shall be illuminated when the fan is activated.

### **CONTROL PANEL**

The forward, top section of the pump enclosure shall consist of two surfaces. The forward surface shall be on a flat, horizontal plane running from side to side of the pump enclosure. Mounted on this surface shall be all valve controls, the primer control, and the discharge relief valve controls (pilot valve). This surface shall be referred to as the "control panel".

All valves shall be the self-locking type, activated by a lever control that is connected to the valve with a direct linkage utilizing friction locking bell cranks and universal ball swivels. The slots for the control levers shall have an etched zinc bezel to trim the opening. The bezel shall be color coded and labeled "OPEN" and "CLOSED". The slots shall be evenly spaced with any unused slot supplied with necessary hardware beneath the panel for the addition of control handles for additional options, which may be added in the future.

### **INSTRUMENT PANEL**

The surface behind the above described area shall angle upwards, sloping away from the pump operator, on a flat plane and shall contain all instruments, gauges, test fittings, and optional controls. This surface shall be referred to as the "instrument panel". The instrument panel shall be independent and hinged and latched so that it may be opened. All instruments, gauges, and other equipment shall be installed with sufficient slack in any cabling, tubing, or plumbing to allow the panel to swivel to the fully open position.

### **SIDE PUMP PANELS**

Two (2) panels shall be installed; one on each side of the pump enclosure, where the side discharges, inlets, steamers, and other pump associated equipment are located. These shall be referred to as the "left pump panel" and "right pump panel" respectively. Both of these panels shall be easily removable and held in place with quick release push latches. They shall be fully removable for pump and plumbing access without the need to use hand tools. Any electrical equipment that may be installed shall be equipped with connectors extended to the front so they may be easily separated from the opening created when the below described front access panel is removed.

### **PANEL SURFACES**

The control panel, instrument panel, and both side panels shall be coated with black Line-X® for maximum resistance to abrasion and to minimize glare. The material shall be capable of withstanding the effects of extreme temperatures and weather.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **PUMP PANEL LIGHTS**

The pump operator's control panel and the left and right side pump panels shall each be illuminated by On-Scene Night Axe LED lighting. The pump panel lights shall become energized upon setting the parking brake so the gauge information provided may be consulted at any time the apparatus is parked. A stainless steel shield shall be installed over the pump panel lights to further protect them from the elements and to act as a reflector for additional illumination.

### **MASTER PUMP GAUGES**

The pump vacuum and pressure gauges shall be supplied by Thuemling. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. The gauge shall read -30-0-400 PSI and shall be a minimum of 4-1/2" in diameter. The gauge shall be illuminated with red LED lighting.

### **PRESSURE AND VACUUM TEST PORT**

There shall be a Class1 model 121384 pressure and vacuum test port provided on the pump panel.

### **DISCHARGE TRIM PLATES**

Each gated discharge shall have a chrome plated die cast zinc trim plate around the discharge valve and fitting. The trim plate shall be easily removable without the need to disturb the valve.

### **CENTER WALKWAY**

Approximately 18" of the front section of the pump module shall be a center walkway at chassis frame rail height. The walkway shall be covered with bright aluminum tread plate and shall incorporate a "toe kick" where the walkway meets the vertical sheet that forms the front of the pump enclosure. The walkway shall be the same width as the pump module.

### **LIGHTING**

There shall be two (2) Grote model 60571, LED lights shall be mounted in a manner that adequately illuminates the center walkway and steps for safe operation of the apparatus. The light housing shall be stainless steel and is completely encapsulated in order to provide maximum environmental protection. The lights shall become illuminated when the parking brake is engaged.

### **LEFT SIDE TOOL COMPARTMENT**

#### **TOOL COMPARTMENT BELOW WALKWAY, WITH DOOR AND LIGHT**

There shall be a tool compartment under the pump operator's walkway. The compartment shall have a vertically hinged swing-open door. The door shall be of the single pan design and shall be positively latched in the closed position utilizing a pushbutton latch. This compartment shall have Dri-Dek flooring and two (2) drain holes at the rear of the compartment. A light shall be provided in the compartment.

### **RIGHT SIDE TOOL COMPARTMENT**

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **TOOL COMPARTMENT BELOW WALKWAY, WITH DOOR AND LIGHT**

There shall be a tool compartment under the pump operator's walkway. The compartment shall have a vertically hinged swing-open door. The door shall be of the single pan design and shall be positively latched in the closed position utilizing a pushbutton latch. This compartment shall have Dri-Dek flooring and two (2) drain holes at the rear of the compartment. A light shall be provided in the compartment.

### **LEFT SIDE RUNNING BOARD**

A modular bolt-on running board shall be installed on the side of the pump module. The running board shall be constructed of anti-slip tread plate. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. The running board shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.

### **RIGHT SIDE RUNNING BOARD**

A modular bolt-on running board shall be installed on the side of the pump module. The running board shall be constructed of anti-slip tread plate. There shall be a soft suction hosewell compartment recessed in the running board. The floor of the compartment shall be covered with Dri-Dek flooring. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. The running board shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.

### **STORAGE WELL STRAPS**

There shall be two (2) Pac Trac model 1008 straps provided with the storage well. The straps shall be installed over the top of the compartment to retain the hose.

### **CROSSLAY CONFIGURATION**

There shall be two (2) 1-1/2" crosslay pre-connects located ahead of the walkway. Class1 high-pressure flex hose with stainless steel couplings shall be used in the plumbing.

A Trident 90° swivel elbow shall be utilized to keep the hose from kinking when pulled from either side of the apparatus. The swivel for each crosslay shall be located outboard for ease of making connections while changing hose.

The pre-connect hose beds shall be sized to accommodate the following hose load:

The 1-1/2" crosslay pre-connect shall have a capacity of 200' of 1-3/4" double jacket fire hose.

The hose shall be single stack.

The 1-1/2" crosslay pre-connect shall have a capacity of 200' of 1-3/4" double jacket fire hose.

The hose shall be single stack.

There shall be a webbing restraint located on each end of the pre-connected crosslays. The webbing shall be a two-piece design and one (1) side of each piece shall be wrapped around the crosslay rollers. Each piece shall be attached to each other in the center of the crosslays using Velcro.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **CROSSLAY COVER**

There shall be an aluminum non-slip tread plate cover installed on the crosslay hose bed. The cover shall not interfere with hose loading when in the open position. When in the open position, the cover shall remain open due to automatically engaging mechanisms that require no type of latch operation to engage or release. The cover shall be provided with one full length stainless steel piano style hinge that shall attach the cover to the body. The cover shall be light yet rigid. Opening of the cover may be performed by one person on one side of the apparatus and yet the cover shall be rigid enough to support weight without deformation.

Stainless steel rollers shall be provided at each end of the crosslay hose bed to facilitate deployment of hose. Vertical rollers shall be installed on each side of the hose bed opening, and a horizontal roller shall be installed under the opening.

The floor of the crosslay shall be covered with Dura-Dek fiber reinforced material. The Dura-Dek shall have "T" beams in parallel connected with cross slats that are first mechanically bonded and then epoxied. The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.

The interior of the speedlay hose bed shall have a maintenance free abraded finish.

There shall be one (1) divider in the crosslay area. The divider shall be fabricated of 3/16" aluminum and be mounted in a channel on each end for adjustability.

The crosslay dividers shall be coated with Line-X®, a black thermo-plastic polyurethane coating. The coating shall be durable enough to withstand the abuse of flying hose couplings without chipping or cracking.

### **FRONT PUMP ACCESS DOOR**

There shall be a tread plate access panel provided on the front of the pump compartment. The panel shall be of the single pan design and shall be positively latched in the closed position utilizing a push button latch. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching.

### **LEFT SIDE PUMP ACCESS PANEL**

There shall be a tread plate door above the left hand side pump panel to allow access to the pump compartment. The vertically hinged panel shall be of the single pan design and shall be positively latched in the closed position utilizing a push button latch. A gas strut shall be provided on the door. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching. The door shall be wired into the door-ajar warning light circuit.

### **RIGHT SIDE PUMP ACCESS PANEL**

There shall be a tread plate door above the right hand side pump panel to allow access to the pump compartment. The vertically hinged panel shall be of the single pan design and shall be positively latched in the closed position utilizing a push button latch. A gas strut shall be provided on the door. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching. The door shall be wired into the door open warning light circuit.

### **AIR HORN BUTTON**

One (1) air horn button shall be provided on the pump panel. The button shall be red in color and included a label reading "AIR HORN".

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **PUMP PANEL LIGHT SWITCH**

There shall be an on/off switch located on the operator pump panel to control the pump panel lights.

### **409 SERIES STAINLESS BODY CONSTRUCTION**

The apparatus body shall be fabricated from 409 series stainless steel. The total outside width of the apparatus body shall not exceed 100 inches (2.54 meters). The width measurement of the sidewalls shall be made from the outside wall of the two opposite sides of the body.

The complete apparatus body shall be fabricated utilizing the break and bend techniques in order to form a strong, yet flexible, uni-body structure. The body shall be constructed with holding fixtures to ensure proper dimensioning. Each apparatus body is specific in design in order to meet the unique requirements of the purchasing fire department.

The main body compartments on each side, as well as the rear center compartment if applicable, shall contain a sweep out floor design. Each compartment shall be made to the most practical dimensions in order to provide maximum storage capacity for the fire department's equipment. The door opening threshold shall be positioned lower than the compartment floor permitting easy cleaning of the compartments.

The body design shall include a "false wall" design in the lower portion of each lower, rear compartment. This is required in order to allow for easy accessibility to the rear electrical components found in the rear taillight cluster area.

The upper area of the apparatus body, directly above the side compartment door openings, a header is to be fabricated from 409 series stainless steel. This area shall be free from any body seams and shall be painted the same color as the apparatus body. The height of the header may vary depending on the following factors: apparatus design, lettering requirements, scene lights and warning light requirements as well as various other options. A "J" channel shall be incorporated into the body design in order to provide a rain gutter to further assist in preventing excessive moisture from getting into the compartments.

Aluminum tread plate overlays bolted to the body shall have acrylic self-adhesive back on the underside, which will provide an insulating barrier between dissimilar metals when it is bolted to the body.

### **ULTRA STAINLESS™ STEEL FASTENERS**

Ultra Stainless™ steel fasteners shall be provided for all exposed and unpainted fasteners throughout the body in locations such as overlays, pump panels, and other numerous hardware mounting locations. The special ingredient in Ultra Stainless™ is Marutex®, which adds 2% molybdenum (moly) to 410 stainless. Moly is the significant component of 316 stainless that provides extra corrosion resistance. The moly is now added to 410 self drilling screws to produce Ultra Stainless™. This combination provides for unprecedented corrosion resistance combined with hardness for drilling.

### **ADDITIONAL HARDWARE**

There shall be a bag of stainless steel nuts, bolts, and washers supplied with the apparatus for mounting of equipment.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **GS-36 BODY SUB FRAME**

To assure proper body alignment and clearance, the body sub frame shall be constructed in a jig and fitted directly on the chassis. The sub frame shall be constructed of 36,000 PSI galvanized steel.

The chassis frame rails shall be fitted with fiber reinforced rubber to isolate the body frame members from direct contact with chassis frame rails.

The main body sub frame shall be constructed from steel tubing. The sub frame shall run the full length of the body and shall be spaced the same width as the chassis frame rails. The main sub frame shall also be the integral support for the water tank. Vertical drop tubes shall be welded to the sub frame. From these vertical drop tubes shall extend cross members constructed of steel angle. These cross members shall extend out to support the compartments. Cross members shall be located at the front and rear of the body and in front and rear of the wheel well opening.

A drop frame, fabricated of steel tube and steel angles, shall support the compartment area behind the rear. The rear drop frame shall be constructed using vertical drop tubes, welded to the main sub frame. All drop frame structures shall be welded directly to the body sub frame to allow the body to be a completely separate structure from the chassis.

After fabrication the sub frame shall be hot dip galvanized for maximum protection against corrosion.

### **BODY MOUNTING**

The body sub frame shall be fastened to the chassis frame with a minimum of six (6) spring loaded body mounts. Each mount shall be configured using a two-piece bracket. The two (2) brackets shall be fabricated of steel plates. The plates shall be galvanized to prevent any corrosion. Each mounting assembly shall utilize two (2) plated bolts and two (2) heavy duty springs. The assembly design shall allow the body and sub frame to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the spring mounting system shall limit 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 shall not be acceptable.

### **TANK MOUNTING**

The water tank shall rest on the sub frame cross members which are spaced as required by the tank manufacturer.

The tank shall be isolated from the cross members through the use of hard rubber strips with a minimum Rockwell hardness of 60 durometer. Additionally, the tank shall be supported around the entire perimeter and captured front and rear as well as side to side to prevent the tank from shifting during vehicle operations.

Although the tank shall be designed on a free floating suspension principle, it shall be required that the tank have adequate hold down restrains to minimize movement during vehicle operations.

The tank shall be completely removable without disturbing or dismantling the apparatus structure.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### EXHAUST HEAT DEFLECTOR SHIELD

There shall be a 5" heat deflector shield installed over the exhaust to aid in dissipating the heat to prevent exhaust heat from adversely affecting anything stored in the body.

### LEFT SIDE BODY CONFIGURATION

#### COMPARTMENT L1

There shall be a full height compartment located ahead of the rear wheels on the left side of the apparatus body. This compartment shall be designated as L1 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 43.00" wide x 55.50" high
- Usable Depth 25.75"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The rollup door shall have a satin finish.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 48" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be one (1) full height, slide out aluminum tool board located in the full depth compartment. The tool board shall utilize a locking roller assembly to lock the tool board in both the opened and closed position. The tool board shall be mounted to an adjustable unistrut to allow the board to be relocated for best fit in the compartment.

The tool board shall have a Line-X® finish.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

The roll up door shall be equipped with a heavy duty pull down strap.

There shall be one (1) permanent vertical partition installed in the full height compartment. The partition shall match the compartment interior.

There shall be four (4) stainless steel strut channels, two (2) per side, installed in the full depth, full height compartment.

There shall be two (2), aluminum adjustable shelves installed on the apparatus in the full depth compartment. The shelves shall be constructed of 3/16" aluminum sheet with 2" lips. The shelves shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

There shall be four (4) applications in the compartment that shall utilize Turtle Tile Plastics interlocking squares. Each square shall be made from polyvinyl chloride that is flame and chemical resistant. For maximum slip resistance and drainage, each square shall have a grid surface design.

### COMPARTMENT L2

There shall be a standard height compartment located above the rear wheels on the left side of the apparatus body. This compartment shall be designated as L2 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 61.00" wide x 24.00" high
- Usable Depth 25.75"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The rollup door shall have a satin finish.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 18" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) stainless steel strut channels, two (2) per side, installed in the full depth compartment.

There shall be one (1), rollout tray installed in the compartment. The tray shall be provided with an On-Scene Cargo Slide roller type assembly. The out and down roller assembly shall have a rated capacity of 250 lb. distributed load, 90% extension capability, and a 30 degree tip down capability. The roller assembly shall be bolted to vertical struts to allow for height adjustment of the tray. A mechanical lock assembly shall be provided to lock the tray in the extended position and the retracted position. The tray shall be constructed of 3/16" aluminum sheet with 3" lips. The tray shall be coated with Line-X®, a thermoplastic polyurethane coating. The roller assembly shall be constructed of anodized aluminum and stainless steel fasteners.

There shall be two (2) applications in the compartment that shall utilize Turtle Tile Plastics interlocking squares. Each square shall be made from polyvinyl chloride that is flame and chemical resistant. For maximum slip resistance and drainage, each square shall have a grid surface design.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

The roll up door shall be equipped with a heavy duty pull down strap.

### COMPARTMENT L3

There shall be a full height compartment located behind the rear wheels on the left side of the apparatus body. This compartment shall be designated as L3 within these specifications and any ensuing paperwork or drawings after contract execution.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

- Door Opening 35.00" wide x 55.50" high
- Usable Depth 25.75"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The rollup door shall have a satin finish.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 48" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) stainless steel strut channels, two (2) per side, installed in the full depth, full height compartment.

There shall be two (2), aluminum adjustable shelves installed on the apparatus in the full depth compartment. The shelves shall be constructed of 3/16" aluminum sheet with 2" lips. The shelves shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

There shall be three (3) applications in the compartment that shall utilize Turtle Tile Plastics interlocking squares. Each square shall be made from polyvinyl chloride that is flame and chemical resistant. For maximum slip resistance and drainage, each square shall have a grid surface design.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

The roll up door shall be equipped with a heavy duty pull down strap.

### **RIGHT SIDE BODY CONFIGURATION**

#### COMPARTMENT R1

There shall be a full height compartment located ahead of the rear wheels on the right side of the apparatus body. This compartment shall be designated as R1 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 43.00" wide x 55.50" high
- Usable Depth 25.75" lower and 14.25" upper
- Intermediate divide height 26.50"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The rollup door shall have a satin finish.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

The compartment shall have two (2), 48" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) stainless steel strut channels, two (2) per side, installed in the full depth portion of the compartment. In the shallow depth portion of the compartment there shall be four (4) strut channels, two (2) per side.

There shall be two (2), aluminum adjustable shelves installed on the apparatus in the shallow depth compartment. The shelves shall be constructed of 3/16" aluminum sheet with 2" lips. The shelves shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

There shall be three (3) applications in the compartment that shall utilize Turtle Tile Plastics interlocking squares. Each square shall be made from polyvinyl chloride that is flame and chemical resistant. For maximum slip resistance and drainage, each square shall have a grid surface design.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

The roll up door shall be equipped with a heavy duty pull down strap.

### **COMPARTMENT R2**

There shall be a standard height compartment located above the rear wheels on the right side of the apparatus body. This compartment shall be designated as R2 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 61.00" wide x 24.00" high
- Usable Depth 14.25"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The rollup door shall have a satin finish.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 18" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) stainless steel strut channels, two (2) per side, installed in the full depth compartment.

There shall be one (1) application in the compartment that shall utilize Turtle Tile Plastics interlocking squares. Each square shall be made from polyvinyl chloride that is flame and chemical resistant. For maximum slip resistance and drainage, each square shall have a grid surface design.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

The roll up door shall be equipped with a heavy duty pull down strap.

### COMPARTMENT R3

There shall be a full height compartment located behind the rear wheels on the right side of the apparatus body. This compartment shall be designated as R3 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 35.00" wide x 55.50" high
- Usable Depth 25.75" lower and 14.25" upper
- Intermediate divide height 26.50"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The rollup door shall have a satin finish.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 48" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) stainless steel strut channels, two (2) per side, installed in the full depth compartment.

There shall be one (1), roll out equipment tray installed on the floor of the compartment. The tray shall be equipped with an Austin Hardware drawer slide. The roller assembly shall have a rated capacity of 300 lbs. distributed load and shall have 100% extension capability. The tray shall be constructed of 3/16" aluminum sheet with 3" lips to prevent items from being shifted during transportation. The tray shall be equipped with the Austin Hardware front drawer release system which allows for one handed latch closed position release. The tray shall be coated with Line-X®, a thermoplastic polyurethane coating and shall be equipped with a locking slide in order to hold the tray in either a fully extended or closed position.

There shall be three (3) applications in the compartment that shall utilize Turtle Tile Plastics interlocking squares. Each square shall be made from polyvinyl chloride that is flame and chemical resistant. For maximum slip resistance and drainage, each square shall have a grid surface design.

There shall be two (2), aluminum adjustable shelves installed on the apparatus in the shallow depth compartment. The shelves shall be constructed of 3/16" aluminum sheet with 2" lips. The shelves shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

The roll up door shall be equipped with a heavy duty pull down strap.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **REAR BODY CONFIGURATION**

#### COMPARTMENT T1

There shall be a full height compartment located at the rear of the apparatus body. This compartment shall be designated as T1 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 0.00" wide x 0" long
- Usable Depth 0.00"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The rollup door shall have a satin finish.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 30" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be a roll out tray installed on the floor of the compartment. The tray shall be provided with a SlideMaster™ model SM3-MP roller type assembly. The roller assembly shall have a rated capacity of 600 lb. distributed load and have 100% extension capability. A mechanical lock assembly shall be provided to lock the tray in the extended or retracted position. The tray shall be constructed of 3/16" aluminum sheet with 3" lips and shall be coated with Line-X®, a thermoplastic polyurethane coating. The tray roller assembly shall have a powder coated finish for added corrosion protection.

### **COMPARTMENT AIR RELEASE**

Each compartment shall be vented to help remove trapped air when closing a compartment door. The vent shall be a rubber gasket in the area of the outboard corners of the compartment. Wiring may also be run through these areas.

### **COMPARTMENT DRAIN HOLES**

Each body compartment shall be equipped with drain holes to allow standing water to exit to underneath the apparatus.

### **WALKWAYS AND OVERLAYS**

All exterior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be overlaid with 3003 H22 Bright Tread Plate to provide a slip resistant surface, even when the surface is wet. All interior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be slip resistant when the surface is dry. The degree of slip resistance shall be in compliance with the intent of NFPA 1901.

Horizontal walkways shall have .080" aluminum tread plate overlays installed and vertical surfaces shall have .125" aluminum overlays. Overlays shall be installed that are totally insulated from the apparatus with nylon shoulder washers that extend into holes in the body. Stainless steel cap nuts shall be employed where bolt ends may damage equipment or cause injury. After the apparatus is painted and the overlays are reinstalled, they shall be additionally sealed at the edges with a caulking compound. The exterior top tread plate overlay shall be mounted flush with the outer edges of the apparatus body.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **STEPPING SURFACES**

All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds. Steps shall be provided at any area that personnel may need to climb and shall be adequately lighted.

### **REAR DECK**

A modular bolt-on deck shall be installed on the rear of the apparatus to form a full width step area. The rear deck shall be constructed of anti-slip bright tread plate. The outside edge of the rear deck shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. The depth of the rear deck shall be 13.25". The rear deck shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.

### **REAR STEPS**

There shall be eight (8) Cast Products bolt-on steps installed on the rear of the apparatus. Each step shall have large open slots to prevent buildup of ice or mud and to provide a handhold when necessary. Steps shall be provided in the following locations:

- Four (4) bolt-on steps on the left rear of the apparatus.
- Four (4) bolt-on steps on the right rear of the apparatus.

The steps shall be adequately lit with LED lighting. There shall be one (1) light located above each set of steps on the rear face of the body, for a total of two (2) lights. Each light shall be located in a manner that shall light all of the steps on its respective side.

### **FRONT BODY STEPS AND LIGHTING**

There shall be three (3) Cast Products folding steps located on the front of the left side body compartments. The folding steps shall have two large open slots to prevent the buildup of ice or mud and to provide a handhold when necessary. The steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of 500 pounds.

The steps shall be adequately lit with LED lighting. There shall be one (1) light located above the steps.

### **FRONT BODY STEPS AND LIGHTING**

There shall be three (3) Cast Products folding steps located on the front of the right side body compartments. The folding steps shall have two large open slots to prevent the buildup of ice or mud and to provide a handhold when necessary. The steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of 500 pounds.

The steps shall be adequately lit with LED lighting. There shall be one (1) light located above the steps.

### **FRONT VERTICAL AREA TREAD PLATE OVERLAYS**

There shall be a tread plate overlay on the vertical areas of each side of the apparatus body. The overlay will be located in front of the L1 and R1 compartments.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **REAR WHEEL WELLS**

The fenders shall be integral with the body sides and compartments with a seamless appearance. The fenders shall be fitted with bolt-in removable full circular inner liners in the wheel well area for ease of cleaning and maintenance. There shall be sufficient clearance provided in the wheel well to allow the use of tire chains when the apparatus fully loaded.

### **STAINLESS STEEL REAR FENDERETTES**

Two (2) stainless steel fenderettes shall be installed at the outboard edge of the rear wheel well area, one on each side. The fenderettes shall be bolted to the apparatus body using nylon washers to space them slightly away from the body to reduce build-up of road grime. The fenderettes shall be constructed of stainless steel that has been polished to a high quality finish.

### **LEFT SIDE REAR WHEEL WELL POSITION - WL1**

There shall be a two (2) air bottle compartment installed in the rear wheel well area. The compartment shall be a vertical design. The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a rotational, molded component that is assembled to the door and frame. This assembly process shall prevent the air bottle from making contact with the stainless steel frame while loading and unloading the air bottle. The door shall have a brushed stainless steel finish.

### **LEFT SIDE REAR WHEEL WELL POSITION - WL3**

There shall be a two (2) air bottle compartment installed in the rear wheel well area. The compartment shall be a vertical design. The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a rotational, molded component that is assembled to the door and frame. This assembly process shall prevent the air bottle from making contact with the stainless steel frame while loading and unloading the air bottle. The door shall have a brushed stainless steel finish.

### **FUEL FILL**

The fuel fill pocket shall be located in the left rear wheel well area. The fuel fill shall utilize a stainless steel Fire Shopp door with a brushed finish. The hinge and frame shall all be constructed out of stainless steel material.

### **RIGHT SIDE REAR WHEEL WELL POSITION - WR1**

There shall be a two (2) air bottle compartment installed in the rear wheel well area. The compartment shall be a vertical design. The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a rotational, molded component that is assembled to the door and frame. This assembly process shall prevent the air bottle from making contact with the stainless steel frame while loading and unloading the air bottle. The door shall have a brushed stainless steel finish.

### **RIGHT SIDE REAR WHEEL WELL POSITION - WR3**

There shall be a speedy dry dispenser installed in the rear wheel well area. The compartment shall be a triangle design. The dispenser shall be able to slide out for use. The dispenser shall have an open top for refilling and dispense through the bottom. The dispenser shall be fabricated from aluminum.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The door shall have a brushed stainless steel finish.

### **BODY RUB RAILS**

Rub rails shall be installed beneath the compartment doors to protect them from damage should the body be brushed or rubbed against another object. The rub rails shall be 3/16" aluminum channel, 2-1/2" x 1". The rub rails shall be highly polished and then bright dip anodized.

The rub rails shall be installed on the body utilizing non-corrosive nylon spacers and secured with stainless steel bolts. The outside edge of the rub rails shall be even with the fenderettes and bolt-on steps to prevent snagging.

### **REAR TOW HOOK**

One (1) rear tow hook shall be installed directly below the rear of the chassis frame rails. The tow hook shall be capable of a 15,000 lb. straight pull rating.

### **HOSE BED**

The hose bed shall be located above the water tank and have a minimum capacity of 30 cubic feet in accordance with the latest NFPA regulations. The inside of the hose bed shall be smooth aluminum. The hose bed shall exit at the rear of the apparatus through a single access opening. The opening shall be free of obstructions that might interfere with the deployment and loading of hose.

The floor of the hose bed compartment shall be constructed of Dura-Dek fiber reinforced plastic material. The flooring shall be fabricated of "T" beam pultrusions in parallel connected with cross slats that are first mechanically bonded and then epoxied, forming a large sheet. The top portion of each "T" cross section shall measure 1-1/4" wide and 3/16" thick with beaded ends. The vertical portion shall be 3/8" thick, beading out at the bottom to a thickness of 1/2" and tall enough to result in an overall height of 1". The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.

Each "T" beam shall be constructed utilizing a core of 250,000 continuous glass fiber strands that are high in resistance to tension, compression and bending. An outer sheath consisting of a continuous strand mat to prevent lineal splitting and slipping shall surround the core. The sheath shall also serve to draw the protective resin to the bar surface. Both reinforcements shall be pulled through an isophthalic polyester resin, treated with antimony trioxide for fire resistance, to form a solid length.

The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. This bright white coating shall be baked on and shall provide a pleasing contrast when installed in the apparatus.

The hose bed shall contain the following hose load:

800' of 5" rubber hose

800' of 2-1/2" double jacket hose

The interior of the hose bed shall be painted the primary body color.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **HOSE BED COVER**

There shall be a heavy-duty 22 oz. hypalon vinyl coated nylon hose bed cover installed on the apparatus. The front edge of the cover shall be retained in a "C" channel to prevent wind from lifting it. The sides of the cover shall be attached to the sides of the hose bed utilizing hooks and bungee cord. The rear of the cover shall be connected using footman loop and J-Hooks with an adjustable buckle.

The color of the vinyl restraint shall be black.

### **HOSE BED DIVIDER**

There shall be one (1) hose bed divider installed in the hose bed. The divider shall be fabricated from 1/4" smooth aluminum plate and an aluminum extrusion. The divider shall have an abraded finish and mounted on hot-dipped galvanized slide rails at the front and rear of the hose bed. Where no obstruction such as a fill tower is present, the slide rails shall allow full movement of the divider along the width of the hose bed. The hose bed divider shall have an oval shaped hand hold slot to assist in moving the divider. This shall provide the capability for variable hose load configurations and capacities.

### **GROUND LADDER STORAGE**

The ground ladders shall be stored beneath the hose bed, to the right of the water tank. The ladders shall be stored vertically on their beam in an aluminum rack with poly scuff strips. The ladders shall be accessible through a hinged painted aluminum door on the rear of the body.

The following ground ladders shall be supplied with the apparatus:

One (1), Alco-Lite model FL-10 folding aluminum ladder with bracket shall be provided. The ladder shall be equipped with heavy cast aluminum swivel safety shoes and carrying handles. The closed dimensions of the ladder shall be 11' 5" long x 5.25" wide. The bracket shall be a high tensile aluminum alloy spring loaded bracket that will hold the ladder in place when the vehicle is in motion. The ladder shall include a heat sensor label to warn if the ladder has been exposed to excessive heat.

One (1), Alco-Lite model PRL-14, 14' aluminum roof ladder shall be provided. The ladder shall be equipped with high strength steel rotating roof hooks with reinforcing brace and steel butt spurs and rounded aluminum top caps for increased durability. The ladder shall include a heat sensor label to warn if the ladder has been exposed to excessive heat.

One (1), Alco-Lite model PEL-24, 24' two section aluminum ladder shall be provided. The ladder shall be equipped with steel butt spurs and rounded aluminum top caps for increased durability, and an oversized 2 1/4" pulley for ease of operation. The ladder shall include a heat sensor label to warn if the ladder has been exposed to excessive heat.

### **PIKE POLE STORAGE**

There shall be two (2) aluminum tubes for the storage of pike poles installed in the ground ladder storage compartment.

The following pike poles shall be supplied with the apparatus:

One (1), Akron Brass model UL-8, 8' fiberglass pike pole shall be provided. The light weight heavy duty pole shall be constructed of one and one quarter inch round fiberglass with a rubber bumper butt style handle.

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## Top-Mount Rescue Pumper Specifications

One (1), Akron Brass model UL-10, 10' fiberglass pike pole shall be provided. The light weight heavy duty pole shall be constructed of one and one quarter inch round fiberglass with a rubber bumper butt style handle.

### **HARD SUCTION HOSE STORAGE ( LADDER COMPARTMENT )**

Provisions shall be made to provide storage for one (1) hard suction hose in the ladder storage compartment.

### **HARD SUCTION HOSE, FIREQUIP**

There shall be one (1), Firequip Maxi-Flex PVC 6" x 10' section of hard suction hose provided.

### **HARD SUCTION HOSE STORAGE**

There shall be one (1) hard suction enclosed hose tray located inside the body, with the capacity to store one (1) section of hard suction hose. Access to the hard suction hose shall be from the rear of the apparatus through a hinged painted aluminum door.

The suction hose storage shall be enclosed behind the left roll up doors.

### **HARD SUCTION HOSE, FIREQUIP**

There shall be one (1), Firequip Maxi-Flex PVC 6" x 10' section of hard suction hose provided.

### **WHEEL CHOCKS**

There shall be one (1) pair of Cast Products model TMC1008-4 wheel chocks provided with the apparatus. The wheel chocks shall be mounted in Cast Products model TMC 1010 mounting brackets.

The wheel chocks shall be stored in locations that are easily accessible under the front of the body on the left side of the apparatus.

### **HANDRAILS**

All handrails, unless otherwise stated, shall be constructed of knurled aluminum of not less than 1-1/4" in diameter. All railing shields and brackets shall be chrome plated, and shall be bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails shall have a drain hole drilled in it at the lowest point.

The following handrails shall be provided on the apparatus:

There shall be a vertical handrail installed at the left rear of the apparatus.

There shall be a vertical handrail installed on the right rear of the apparatus.

There shall be a horizontal handrail installed above the rear compartment below the hose bed.

### **FUEL TANK GAUGE ACCESS PANEL**

There shall be a removable panel provided in the rear compartment to allow for access to the fuel tank gauge without removing the fuel tank.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **LICENSE PLATE BRACKET**

There shall be a license plate bracket mounted on the rear of the apparatus. A clear LED light shall be incorporated into the bracket.

### **FULL WIDTH HOSE BED STEP**

There shall be a full width Grip Strut® step located above the rear compartment door. The step shall be used to assist in reloading the hose bed. The step shall also include hand-holds in the rear of the step to be used when climbing the rear of the truck.

### **QL-12 ELECTRICAL SYSTEM**

Wiring harnesses shall be the automotive type, engineered specifically for the builder's apparatus, and shall meet the following criteria. Under no circumstances shall diodes, resistors, or fusible links be located within the wiring harness. All such components shall be located in an easy to access wiring junction box or the main circuit breaker area. All wiring shall meet white book, baseline advanced design transit coach specification and Society of Automotive Engineers recommended practices. It shall be stranded copper wire core with cross linked polyethylene insulation complying with SAE specification J1128. Each wire shall be hot stamp function coded every three inches starting one inch from the end and continuing throughout the entire harness. In addition to function coding, each wire shall be number, color, and gauge coded.

Wire harnesses shall be wrapped with a high abrasion and chemical resistant thermoplastic polyester elastomer coated polyester yarn for braiding constructions of electrical wiring systems. The braid yarn shall have a minimum tensile strength of 15 lbs. before breaking and have a maximum of 20% elongation before breaking. Temperature properties for the yarn shall range from a minimum 280°F (138°C) service temperature to a maximum -112°F (-80°C) brittleness temperature with a cold flex tolerance of at least -49°F (-45°C).

Harnesses shall be modular in design; a main harness system subdivided into several smaller sub-harnesses. The harness subsections shall be connected using Deutsch branded, heavy duty, environmentally sealed, connectors with silicone seals and a rear insertion/removal contact system. For isolation of electrical "zones" the harness subsections shall consist of a main harness, a pump harness with a separate pump gauge panel harness, a left body harness with a separate left compartment harness, a right body harness with a separate right compartment harness, and a rear body harness with two separate rear compartment harnesses.

The main harness and three body harnesses shall interconnect at a central, easy to reach location and their connectors shall not be obstructed by other harnesses or fuel/air lines. In addition, the main and body harness connectors shall be color coded for ease of identification with their respective colors noted on the accompanying electrical diagrams.

Where connectors are not provided by the electrical component manufacturer, all 12 volt lights and other electrical components (excluding rocker and toggle switches) shall connect to the harnesses using Deutsch brand connectors; butt connectors are considered unacceptable.

All Deutsch connectors shall meet the following criteria:

- All connectors shall have a minimum IP67 rating.
- Temperature range from -67°F (-55°C) to 257°F (125°C) continuous at rated current.
- Only solid contacts will be used. Stamped and formed contacts are unacceptable.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

- All contacts shall be soldered unless a crimping tool or machine is used that gives an even and precise pressure for the terminal being used.
- All contacts shall be pull-tested to insure their integrity.

### **V-MUX ELECTRICAL MANAGEMENT SYSTEM**

The apparatus shall be equipped with a V-MUX Multiplex System. There are several key benefits to multiplexing, one is to reduce the number of connections in a vehicles electrical system, because of this it is important to limit the amount of modules that control certain functions of the vehicle.

#### **Outputs:**

The outputs shall perform all the following items without added modules to perform any of the tasks:

1. Load Shedding: The System shall have the capability to Load Shed with 8 levels any output. This means you can specify which outputs (barring NFPA restrictions) you would like Load Shed. Level 1 12.9v, Level 2 12.5V, Level 3 - 12.1V, Level 4 - 11.7V, Level 5 11.3V, Level 6 10.9V, Level 7 10.5, Level 8 10.1. Unlike conventional load shedding devices you can assign a level to any or all outputs. No add-on modules shall be acceptable; the module with the outputs must perform this function.
2. Load Sequencing: The System shall be able to sequence from 0 8 levels any output. With 0 being no delay and 1 being a 1 second delay, 2 being a 2 second delay and so on. Sequencing reduces the amount of voltage spikes and drops on your vehicle, and can help limit damage to your charging system. No add-on modules shall be acceptable; the module with the outputs must perform this function.
3. Output Device: The System shall have solid-state output devices. Each solid-state output shall be a MOS-FET (Metal Oxide Semiconductor - Field Effect Transistors); MOS-FETs are solid-state devices with no moving parts to wear out. A typical relay when loaded to spec has a life of 100,000 cycles. The life of a FET is more than 100 times that of a relay. No add-on modules shall be acceptable; the module with the outputs must perform this function.
4. Flashing Outputs: The System shall be able to flash any output in either A or B phase, and logic is used to shut down needed outputs in park, or any one of several combined interlocks. The flash rate can be selected at either 80, or 160 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems. No add-on modules shall be acceptable; the module with the outputs must perform this function.
5. PWM: The modules shall have the ability to PWM at some outputs so that a Headlight PWM module is not needed. No add-on modules shall be acceptable; the module with the outputs must perform this function.
6. Diagnostics: An output shall be able to detect either a short or open circuit.

#### **Inputs:**

1. The inputs shall have the ability to switch by a ground or battery signal.
2. The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.

#### **System Network:**

The Multiplex system shall contain a Peer-to-Peer network. A Master Slave Type network is not suitable for the Fire/Rescue industry. A Peer-to-Peer network means that all the modules are equal on the network; a Master is not needed to tell other nodes when to talk.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### System Reliability:

The Multiplex system shall be able to perform in extreme temperature conditions, from -40° to +85° C (-40° to +185° F.) The system shall be sealed against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over voltage and reverse polarity.

### **WEATHERPROOF DOOR SWITCHES**

Due the harsh environment and susceptibility to moisture on the fire ground, the fire apparatus compartment doors shall utilize weatherproof switches. Two different types of switches shall be used. Weatherproof proximity switches shall be utilized where space permits. In tight locations, mechanical weatherproof switches shall be used. **No Exceptions.** The switches shall be used for activation of the compartment lights and to provide a signal to the door open circuit in the cab.

### **TAIL LIGHTS**

There shall be a Whelen 600 series LED tail light assembly installed on each side of the rear of the apparatus. Each assembly shall include one (1) red LED stop/tail light model number 60BTT, one (1) amber LED model 60A00TAR turn light with arrow and one (1) clear halogen backup light model 60F000CR. The lights shall be mounted in a chrome plated four (4) light composite housing. The remaining slot in the housing shall be filled with a warning light specified in the warning light section.

### **MIDSHIP TURN SIGNALS**

There shall be two (2) Truck-Lite model 21 LED midship auxiliary/turn signal lights installed. One (1) light shall be located in the rub rail on each side of the body.

### **BODY GROUND LIGHTING**

There shall be four (4) Grote White 4" round, LED lights model 61E41 installed beneath the apparatus in areas where personnel may be expected to climb on and off of the apparatus. The lights shall illuminate the ground within 30" of the apparatus to provide visibility of any obstructions or hazards. These areas shall include, but shall not be limited to, side running boards and the rear step area.

There shall be four (4) stainless steel ground light brackets provided to position each ground light so as to illuminate the ground within 30" of the apparatus.

### **CLEARANCE LIGHTS**

Grote model 65282 red LED clearance lights shall be installed in the rear tailboard as necessary to be in full compliance with applicable ICC and DOT codes and regulations. Clearance reflectors shall be placed on the apparatus to be in full compliance with applicable ICC and DOT codes and regulations.

### **CHASSIS SUPPLIED BACK UP CAMERA SYSTEM**

There shall be a backup camera system installed in the cab that shall be supplied with the chassis. The camera shall be installed on the rear center upper portion of the apparatus.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### SMART POWER LIBERATOR SERIES LI-15 HYDRAULIC GENERATOR

There shall be a Smart Power LI-15, hydraulic generator installed, providing 10,000 watt electrical output plus an additional 5kW hydraulic power to run the future XRT rescue tool pump.

The generator system shall come with a standard 5 year/1,000 hour fully transferable warranty from the generator manufacturer.

The unit shall come equipped with: generator tray assembly (which includes the generator, hydraulic motor, cooler, fan, electronics package, 10 micron spin-on fluid filter and reservoir), axial piston hydraulic pump with pressure compensated control, and Command and Control Center (CCC) display with all required wiring harnesses. The CCC shall be an interactive operator control center, equipped with smart touch solid state buttons, with displays for voltage, frequency, amperage, hour meter, service reminders, operator warnings, system faults and diagnostics. Standard electronics package shall include smart start engagement to reduce mechanical stress, precise voltage and frequency control, cold start system, automatic load and temperature compensation, integrated diagnostics system, and other automated control features to protect system, vehicle and operator.

The generator cover, the generator electrical enclosure, the oil cooler/fan enclosure, the hydraulic fluid reservoir and other steel structural components will be protected with a white powder coat finish. An aluminum grate will be attached over top of the assembly to provide a non-slip walking surface.

The body of the generator tray assembly (including reservoir) shall be 35" long x 15" wide x 22" high. The XRT pump will protrude an additional 6" from one end, with fittings for hose connections. The approximate weight of the tray assembly is 500 pounds. The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

#### Ratings and Capacity

Rating:

12000 watts peak

10000 watts continuous AC, plus 5kW hydraulic

Volts:

120/240 volts

Phase:

Single, 4 wire

Frequency:

60 Hz

Amperage:

83 amps @ 120 volts or 42 amps @ 240 volts

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

Engine speed at engagement:

Standard soft start feature allows for any speed engagement

Operation range:

800 to 3000 RPM

### Testing

The generator shall be tested in accordance with NFPA 1901.

*Shop Note: The generator shall have the option to install the XRT system at a later date. There shall be enough room allowed in the dunnage area to account for the future XRT system, which requires an additional oil cooler and tank.*

There shall be a remote start switch installed on the pump panel for the generator.

### **GENERATOR PTO CONNECTION**

The hydraulic pump for the generator shall be connected to the chassis transmission through a "Hot Shift", electrically engaged power-takeoff system. The control to engage and disengage the power-takeoff system shall be installed in the chassis cab.

The PTO shall be capable of being operated while in "Drive". This option shall allow for onboard 120/240 volt lights to be operated while driving down the road.

### **GENERATOR DISPLAY**

There shall be a Command and Control Center provided with the generator. The digital meter display shall constantly monitor and display voltage, frequency, current, and system run time. The display shall be capable of displaying total accumulated run time hours when the MODE button is pressed. This information shall be stored in a non-erasable memory.

The Smart Power generator shall be located at the front of the body.

### **16 CIRCUIT NON-GFI LOAD CENTER**

There shall be a 120/240 volt load center incorporated into the 120/240 volt wiring system. The load center shall include adequate circuit breakers to protect the loads specified on the apparatus. The entire 120/240 volt electrical system shall be installed in strict compliance with NFPA 1901. This shall include all testing, labeling, wiring methodology, and dimensional requirements. Certification of compliance shall accompany the apparatus at the time of delivery. All 120/240 volt A.C. Wiring shall be done in accordance with NFPA 1901 as well as nationally accepted electrical codes.

### **BRANCH CIRCUIT OVERCURRENT PROTECTION**

Over current protection devices shall be provided for circuits in accordance with NFPA 1901. The load center shall be equipped with a non-GFI two pole main breaker when the six or more individual branch circuits are present. Over current protection devices shall be marked with labels to identify the function of the circuit they protect.

The load center shall be located on the back wall of the L1 compartment.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

### **TRANSFER SWITCH**

There shall be a transfer switch installed that will automatically switch from the 120 volt shoreline power to 120 Volt generator power when required. The transfer switch shall be in close proximity to the load center.

### **UPPER ZONE A**

There shall be one (1) Whelen Engineering Freedom, model FN72VLED, 72" LED lightbar installed on the chassis cab roof. The lightbar shall be equipped with eight (8) forward facing linear red LED, two (2) forward facing linear white LED, two (2) corner forward facing red LED, and two (2) side facing red LED lights.

The lightbar shall be equipped with clear lenses. All clear LED lights in the lightbar shall be deactivated in the Blocking Right of Way mode.

### **UPPER ZONE C**

There shall be two (2) Whelen, model B6MMRRP, B6 Series Super-LED® beacons with LED directional lights in a single fixture installed high at the rear of the apparatus. The Super-LED® beacons shall have red lenses and the lower LEDs shall have red lenses.

### **LOWER ZONE A**

The warning lights shall be supplied and installed by the chassis manufacturer.

### **LOWER ZONE B**

There shall be two (2) Whelen, model 60R02FCR, 600 Series Super-LED® lights with chrome flanges installed. Each light shall have red LEDs and a clear lens.

### **LOWER ZONE C**

There shall be two (2) Whelen, model 60R02FCR, 600 Series Super-LED® lights with chrome flanges installed. Each light shall have red LEDs and a clear lens.

### **LOWER ZONE D**

There shall be two (2) Whelen, model 60R02FCR, 600 Series Super-LED® lights with chrome flanges installed. Each light shall have red LEDs and a clear lens.

### **TRAFFIC ADVISOR™**

There shall be one (1) Whelen model TAL65 LED Traffic Advisor™ installed on the apparatus. The traffic directional light shall contain six (6) medium intensity LED lamps in a black low profile flat style housing.

The traffic directional light shall be recess mounted in the rear of the body.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

There shall be a Whelen, model TACTLD1 traffic advisor control head provided with the Traffic Advisor™. The control head shall be housed in a rugged extruded aluminum case and shall offer eight programmable sequence flash patterns.

### **WHELEN 12V RECESSED LIGHT**

There shall be two (2) Whelen, model PFA1, Pioneer™ Super-LED® lights in a semi-recessed mount installed on the apparatus.

The lights shall be a Whelen Single Panel Pioneer™, model PFA1 Super-LED® floodlight. Each rectangular extruded light fixture with die cast end caps shall measure 8-3/16" wide by 4-1/4" high by 2-7/8" deep and have a white powder coat finish. Each light fixture shall have a single panel of (2) horizontal clusters of LED lamps with a molded vacuum metalized reflector that draws 3 amps at 12 Vdc. Each light shall have the Whelen HDP® Heavy-Duty Professional five-year warranty.

Each light shall be complete with one (1) Whelen, model PBA103, semi-recessed mount with a chrome flange. The lights shall be set at a 15° downward angle.

The 12 volt front scene light shall be controlled by one (1) switch located in the chassis cab and one (1) located at the pump panel. Each switch shall have an indicator that shall illuminate when the switch is in the "ON" position. The light shall be controlled by one (1) switch at each location. Each switch shall be labeled "LEFT SCENE."

The 12 volt scene light shall be located on the left side of the apparatus body.

### **WHELEN 12V RECESSED LIGHT**

There shall be two (2) Whelen, model PFA1, Pioneer™ Super-LED® lights in a semi-recessed mount installed on the apparatus.

The lights shall be a Whelen Single Panel Pioneer™, model PFA1 Super-LED® floodlight. Each rectangular extruded light fixture with die cast end caps shall measure 8-3/16" wide by 4-1/4" high by 2-7/8" deep and have a white powder coat finish. Each light fixture shall have a single panel of (2) horizontal clusters of LED lamps with a molded vacuum metalized reflector that draws 3 amps at 12 Vdc. Each light shall have the Whelen HDP® Heavy-Duty Professional five-year warranty.

Each light shall be complete with one (1) Whelen, model PBA103, semi-recessed mount with a chrome flange. The lights shall be set at a 15° downward angle.

The 12 volt rear scene light shall be controlled by a switch located in the chassis cab. The switch shall have an indicator that shall illuminate when the switch is in the "ON" position. The light shall be controlled by one (1) switch. The switch shall be labeled "REAR SCENE."

In addition to the switch located in the cab, the 12 volt rear scene light shall be activated by the rear work light switch and when the apparatus is placed in reverse.

The 12 volt scene light shall be located on the rear of the apparatus body.

### **WHELEN 12V RECESSED LIGHT**

There shall be two (2) Whelen, model PFA1, Pioneer™ Super-LED® lights in a semi-recessed mount installed on the apparatus.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

The lights shall be a Whelen Single Panel Pioneer™, model PFA1 Super-LED® floodlight. Each rectangular extruded light fixture with die cast end caps shall measure 8-3/16" wide by 4-1/4" high by 2-7/8" deep and have a white powder coat finish. Each light fixture shall have a single panel of (2) horizontal clusters of LED lamps with a molded vacuum metalized reflector that draws 3 amps at 12 Vdc. Each light shall have the Whelen HDP® Heavy-Duty Professional five-year warranty.

Each light shall be complete with one (1) Whelen, model PBA103, semi-recessed mount with a chrome flange. The lights shall be set at a 15° downward angle.

The 12 volt front scene light shall be controlled by one (1) switch located in the chassis cab and one (1) located at the pump panel. Each switch shall have an indicator that shall illuminate when the switch is in the "ON" position. The light shall be controlled by one (1) switch at each location. Each switch shall be labeled "RIGHT SCENE."

The 12 volt scene light shall be located on the right side of the apparatus body.

### **WHELEN 120V TELESCOPING LIGHT**

There shall be one (1) Whelen, model PFP1AP, Pioneer Plus™ Super-LED® light with Pole/Pedestal mount adapter on a side mount push-up pole installed on the apparatus.

The light shall be a Whelen Single Panel Pioneer Plus™, model PFP1AP Super-LED® floodlight. The rectangular extruded light fixture with die cast end caps shall measure 8-3/16" wide by 4-1/4" high by 2-7/8" deep and have a white powder coat finish. The light fixture shall have a single panel of (2) horizontal clusters of LED lamps with a molded vacuum metalized reflector that draws .625 amps at 120 Vac. The lights shall be mounted with an aluminum adapter plate attached to the pole with a switch box (switch not included) and a locking swivel joint with a 3/4" diameter NPT threaded base to allow the lights to be manually tilted up/down and locked in position by the operator. There shall be a removable handle standard on the lighthouse. The light shall have the Whelen HDP® Heavy-Duty Professional five-year warranty.

The light shall be complete with one (1) Whelen Pioneer™ 3000 series, model 86930VA3, side mount bottom adjust push-up pole. The pole shall have 12" outer body and 57" silver pole assembly with a 3C Internal input. The pole shall have a white powder coat finish. The pole shall have silver powder coated stand-off 2" non-adjustable mounting brackets. The pole shall be complete with a cradle, allowing the pole to be used as a grab handle.

The 120 volt light shall be controlled by a switch located on the pump operator's panel. The switch shall have an indicator that shall illuminate when the switch is in the "ON" position.

The light shall be located on the side of the top mount walkway entrance on the left side.

### **WHELEN 120V TELESCOPING LIGHT**

There shall be one (1) Whelen, model PFP1AP, Pioneer Plus™ Super-LED® light with Pole/Pedestal mount adapter on a side mount push-up pole installed on the apparatus.

The light shall be a Whelen Single Panel Pioneer Plus™, model PFP1AP Super-LED® floodlight. The rectangular extruded light fixture with die cast end caps shall measure 8-3/16" wide by 4-1/4" high by 2-7/8" deep and have a white powder coat finish. The light fixture shall have a single panel of (2) horizontal clusters of LED lamps with a molded vacuum metalized reflector that draws .625 amps at 120 Vac. The lights shall be mounted with an aluminum adapter plate attached to the pole with a switch box (switch not included) and a locking swivel joint with a 3/4" diameter NPT threaded base to allow the lights to be manually tilted up/down and locked in position by the operator.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

There shall be a removable handle standard on the lighthouse. The light shall have the Whelen HDP® Heavy-Duty Professional five-year warranty.

The light shall be complete with one (1) Whelen Pioneer™ 3000 series, model 86930VA3, side mount bottom adjust push-up pole. The pole shall have 12" outer body and 57" silver pole assembly with a 3C Internal input. The pole shall have a white powder coat finish. The pole shall have silver powder coated stand-off 2" non-adjustable mounting brackets. The pole shall be complete with a cradle, allowing the pole to be used as a grab handle.

The 120 volt light shall be controlled by a switch located on the pump operator's panel. The switch shall have an indicator that shall illuminate when the switch is in the "ON" position.

The light shall be located on the side of the top mount walkway entrance on the right side.

### **ELECTRIC CORD REEL**

There shall be a Hannay, model ECR1616-17-18, 120 volt electric rewind cord reel installed on the apparatus. A push button labeled REEL REWIND shall be installed for 12 volt rewinding of the cord reel. Rollers shall be supplied to prevent damage to the electrical cable if pulled in any direction.

The cord reel shall be equipped with 200' of yellow STW Seoprene 10/3 wire installed with a cable stop to prevent damage to cable fittings.

### **JUNCTION BOX**

There shall be an Akron Brass Extenda-Lite, model EJBX, back lighted electrical junction box equipped with four (4) electrical receptacles, two (2) per side. Each receptacle shall be equipped with a spring loaded snap cover. The cord reel shall be prewired to the cast aluminum junction box to supply power to the four (4) receptacles. An extension cord shall be connected to the junction box through a heavy-duty water resistant strain relief and flexible extender. Each side of the junction box shall be fitted with polypropylene faceplates, which are backlighted, so that plug orientation to the receptacles is quick and easy to align.

The junction box shall be equipped with an Akron Brass model CS cord stop.

A tread plate mounting bracket shall be included.

There shall be one (1) NEMA L5-15R, 120 volt, duplex, 3-wire, twistlock receptacle installed in the junction box. The receptacle shall have a 15 ampere rating.

There shall be two (2) NEMA 5-20R, 120 volt, duplex, 3-wire, straight blade (household type) receptacles installed in the junction box. Each receptacle shall have a 20 ampere rating.

There shall be one (1) NEMA L5-20R, 120 volt, single, 3-wire, twistlock receptacle installed in the junction box. The receptacle shall have a 20 ampere rating.

The reel shall be located in the dunnage compartment.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **BODY PAINT PREPARATION**

After the body and components have been fabricated and assembled they shall be disassembled prior to painting, so when the apparatus is completed, there shall be finish paint beneath the removable components. The body shall be totally removed from the chassis during the painting process to insure the entire unit is covered. The apparatus body and components shall be metal finished as follows to provide a superior substrate for painting.

All steel sections of the body shall undergo a five-step degreasing/cleaning process starting with an alkaline cleaner to degrease the metal surface and then rinsed. Next, a phosphoric acid rinse shall be performed to begin the etching process. A phosphatizer is applied to continue the etching process and deposit a protective film on the metal surface. The last step shall consist of a non-chromatic rinse to seal the protective film and rinse off excess solution. All aluminum surfaces undergo the last four steps in the cleaning process since degreasing of the metal is not needed.

After the cleaning process the body and its components shall be primed with a High Solids primer and the seams shall be caulked.

All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be heavily chrome plated. Iron fittings shall be copper under-plated prior to chrome plating.

### **PAINT PROCESS**

The paint process shall follow the strict standards as set forth by PPG Fleet Finish Guidelines.

The body shall go through a three-stage paint process: primer coat, base coat (color), and clear coat. In the first stage of the paint process the body shall be coated with PPG F3980 Low VOC / High Solids primer to achieve a total thickness of 2-4 mills. In the second stage of the paint process the body shall be painted with PPG FBCH Delfleet™ High Solids Polyurethane Base Coat. A minimum of two to three coats of paint shall be applied to achieve hiding. In the final stage of the paint process the body shall be painted with PPG DCU-2002 Clear Coat. A minimum of two to three coats shall be applied to achieve a total dry film thickness of 2-3 mills.

As part of the curing process the painted body shall go through a Force Dry / Bake Cycle process. The painted components shall be baked at 185 degrees for 3 hours to achieve a complete coating cure on the finished product.

### **HAND POLISHED**

After the Force Dry / Bake Cycle and ample cool down time, the coated surface shall be sanded using 3M 1000, 1200, and/or 1500 grit sandpaper to remove surface defects. In the final step, the surface shall be buffed with 3M super-duty compound to add extra shine to coated surface. No more than .5 mil of clear shall be removed in this process.

### **BODY COLOR**

The body shall be painted with PPG High Solids Polyurethane Base Coat. The single tone body shall be painted (RED) PPG# FBCH-71096-ALT.

# SMEAL DEMO

## Top-Mount Rescue Pumper Specifications

### **UNDERCOATING**

The apparatus shall undergo a two (2) step undercoating process. The first step shall be a rubberized polyurethane base compound that is applied after the body has been primed. The materials used incorporate unused paint products to reduce the amount of waste released into the environment. This coat shall be applied to all hidden pockets and surfaces that shall not be visible after completion.

As a final step, the entire underside of the body shall be coated with a bituminous based automotive type undercoating when the apparatus is completed. During this application, special care shall be taken to avoid spraying the product on air lines, cables, or other items that would cause normal maintenance to be hindered.

### **COMPARTMENT COATING**

The interior of the body compartment shall be coated with gray Line-X® thermoplastic polyurethane coating. The coating shall be durable enough to withstand every day abuse of equipment removal and shifting.

### **LINE-X® THERMOPLASTIC COATING**

In designated areas, Line-X® XS-350, a two component spray-in-place thermoplastic polyurethane system shall be used for maximum protection of the body and equipment. Line-X® XS-350 is a 100% high performance aromatic solids pure polyuria elastomeric membrane. The coating shall be a fast cure, textured surface, multi-purpose material designed for commercial and industrial applications. It shall exhibit excellent adhesion to the body and serve as a protective, abrasion resistant liner where applied.

The coating shall exhibit the following minimum typical physical properties:

- Tensile strength - 3,432 PSI (ASTM D-412)
- Elongation - 162% (ASTM D-412)
- Tear Strength - 783 PLI (ASTM D-624)
- Shore D Hardness - 60 +/-1 (ASTM D-2240)

### **TOUCH UP PAINT**

One (1) two ounce bottle of acrylic enamel touch-up paint or two (2) touch up paint pens, if color is available, shall be supplied.

### **CORROSION PREVENTION**

One (1) 3.75 ounce tube of Electrolysis Corrosion Kontrol (ECK) shall be provided to use whenever additional items are mounted to the apparatus.

ECK protects aluminum and stainless steel against electrolytic reaction, isolates dissimilar metals and gives bedding protection for hardware and fasteners. ECK contains anti-seizing lubricant for threads. ECK is dielectric and perfect for use with electrical connectors.

# **SMEAL DEMO**

## **Top-Mount Rescue Pumper Specifications**

### **NFPA COMPLIANT REFLECTIVE STRIPING**

Reflective striping shall be applied to the exterior of the apparatus in a manner consistent with NFPA 1901. It shall consist of a straight, 4" wide stripe along the front of the chassis and along the sides, staying below the tops of the wheel well areas.

### **REFLECTIVE STRIPE TERMINATION**

The NFPA reflective stripe located on the side of the apparatus shall terminate at the side of the front bumper.

There shall also be reflective striping provided on the front face of the bumper.

The color of the main reflective striping on the apparatus shall be white.

### **RUB RAIL REFLECTIVE STRIPING**

There shall be 2" reflective striping installed in the rub rail channel. The reflective striping shall be diamond grade quality material for increased visibility. The reflective shall be silver in color.

### **CAB DOOR REFLECTIVE STRIPING**

The reflective striping on the inside of the chassis door shall be provided by the chassis manufacturer.

### **CHEVRON REFLECTIVE STRIPING ON REAR**

In addition to the custom striping pattern supplied on the apparatus, there shall be additional reflective striping applied to the entire rear of the unit. The reflective striping shall cover at least 50% of the rear facing vertical surface per NFPA 1901. The striping shall consist of alternating reflective stripes. Each stripe shall be a minimum of 6" in width and shall be applied to the apparatus at 45° angle.

The chevron pattern shall include the any other painted storage compartment doors. The T1 Compartment shall be excluded from the chevron pattern.

### **CHEVRON REFLECTIVE STRIPING, RED/FLUORESCENT YELLOW-GREEN**

The chevron striping shall consist of 3M part numbers 1172 EC, red and 3983, fluorescent yellow-green.

Only 3M Diamond Grade™ VIP Reflective Striping shall be used. 3M Diamond Grade™ VIP Reflective Striping is a wide angle prismatic lens reflective sheeting designed for the production of durable traffic control signs and delineators that are exposed vertically in service. This sheeting is designed to provide higher sign brightness than sheetings that use glass bead lenses. It is intended to also provide high sign brightness in the legibility distance where other sheetings do not.

### **REFLECTIVE FLAGS - WAVY EAGLE**

There shall be Two (2) 9" reflective American Flags installed on the apparatus. The flags shall have a wavy design with a bald eagle head on them.

### **GOLD LEAF LETTERING**

There shall be twenty two (22) 22KT gold leaf letters provided and installed on the apparatus. The letters shall be approximately 8" tall with black outline and shadow.