

**Prepared for Sparks Fire and
Rescue, NV**



Rosenbauer Custom EXT Pumper



APPARATUS OVERVIEW

NFPA 2016 STANDARDS

This unit shall comply with the NFPA standards effective January 1, 2016.

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

A plate that is highly visible to the driver while seated shall be provided which states the overall height, length, and gross vehicle weight rating.

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

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

OVERALL HEIGHT

An overall height restriction has not been specified for this apparatus.

MAX LENGTH

The maximum length of the apparatus shall not exceed 32' - 4.00".

OVERALL WIDTH

An overall width restriction has not been specified for this apparatus.

MAX WHEELBASE

The maximum wheelbase of the apparatus shall not exceed 200.00".

ANGLE OF APPROACH

The angle of approach for the apparatus shall not be less than eight (8) degrees as specified by the current edition of NFPA 1901.

ANGLE OF DEPARTURE

The angle of departure for the apparatus shall not be less than eight (8) degrees as specified by the



current edition of NFPA 1901.

ELECTRONIC STABILITY CONTROL

Electronic stability control shall be supplied on the chassis.

FORCE FUNDS

Each unit shall have a force fund of \$5000.00. The accounting of these funds shall be on changes orders provided by the dealer. All change orders shall be signed by both the fire department and the dealer. Any unused funds shall be the property of the fire department and returned to the department upon delivery of the unit.



APPARATUS CHASSIS SPECIFICATIONS

CAB CUSTOM STYLE

The cab shall be a custom, cab over engine style, with the driver and officer positions ahead of the engine and front axle. The cab shall be specifically designed and manufactured for the fire service industry.

The cab shall be designed and assembled by the apparatus manufacturer in a facility located on the manufacturer's premises. No Exceptions.

The cab shall be of a totally enclosed full tilt design, with the interior area completely open to improve visibility and verbal communication between the occupants. The cab shall be capable of tilting 45-degrees, allowing the chassis engine to be removed, if required, without tilting the cab beyond 45-degrees. No Exceptions.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics. No solid mounted rear lock downs shall be acceptable. No Exceptions.

The front cab pivot assemblies shall be 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cab super-structure shall be designed with high strength 6061-T6 aluminum extrusions and 3/16" 5052-H32 aluminum plate. This shall include the "A", "B", "C" and "D" extruded pillars, triple wall front end reinforced by 3/16" thick x 2"x3" extrusion tubes, 3/16" side walls and rear wall. This shall offer superior occupant protection in the event of vehicle impact.

The extrusions shall provide adequate space for routing of wiring and hoses which will provide service accessibility. Routing of harnessing which requires pulling of wires through tubes will not be allowed. No Exceptions.

The "A" pillar shall be of a closed section, one-piece extrusion extending from the cab header to the bottom of the cab. This design shall ensure strength and superior resistance to buckling in the event of a frontal impact.



The cabs front corners shall be constructed of 5052-H32 stamped aluminum to provide a consistent material composition. The stamping process alleviates the high tendency of fractures through the fusing of dissimilar metal composition as appears with a casting process.

Cast cab components, including cab corners, "A" pillars and front fascia components shall not be acceptable due to the high tendency of fractures. No Exceptions.

Additional cab strength shall be obtained through closed section, dual extrusions in the construction of the "D" pillars.

The front facade shall be constructed with dual wall .19" thick 5052-H32 aluminum plates which make up the front bulkhead, reinforced by .19" thick 6061-T6 aluminum extrusion (box-sections), though-out the inner and outer perimeter of the front end / facade. The reinforcing third wall / barrier is .13" thick 5052-H32 work hardened aluminum facade panels. All panels shall be welded, no adhesive.

The cab side wall of the cab shall be 3/16" thick 5052-H32 aluminum plate. The cab side plate shall wrap the corner of the cab b pillar and slam post. The cab rear wall plates shall be reinforced with a minimum of two (2) 3/16 x 3" aluminum sections; the cab side reinforcements shall be a minimum of 28" apart and span from the cab B pillar and cab C pillar.

The rear wall of the cab shall be 3/16" thick 5052-H32 aluminum plate. The rear cab plate shall wrap the corner of the cab and attach to the cab D pillar and slam post. The cab rear wall plates shall be reinforced with four horizontal and dual vertical support sections; the dual vertical support structure shall consist of 1/8" thick x 2" 6061-T6 aluminum tubes and the horizontal hat sections shall consist of 1/8" thick x 4" 5052-H32 aluminum. The dual vertical support sections shall be 40" a-part, and the cab shall contain a minimum of four (4) 4" hat section horizontal supports.

Additionally, the rear edge of the floor shall include a 3/16" 6061-T6 aluminum tube extrusion (under the floor) and a 7" 5052-H32 aluminum cab floor support section (above the floor)

The outside cab width shall measure 99" across. The interior cab shall have a width of 93".

The cab length shall measure 77.3" from the center of the front axle to the front cab skin and 70" from center of the front axle to the back of the cab, for a total cab length of 147.3".

The cab shall also feature ample driver and officer foot room, a total of 3.7 square feet for the driver and 4.45 square feet of floor space at the officer's feet. (No exceptions)

The crew floor shall feature a complete flat floor design, including provisions for a one o'clock PTO inclusion, while still offering an uninterrupted 25 total square feet of space.



The leading edge of the cab floor from the steps shall meet NFPA 13-7.3 slip resistance requirements, by using bi-directional, knurled trim piece on both the front and rear cab doors. No Exceptions.

The cab shall incorporate a two-step design at each door, with a first step height of approximately 22" from the ground. The leading edge of the first step shall be 5" further outboard than the second step to provide a staircase design for safer egress.

The front cab first step shall measure a minimum of 32" wide x 9-1/2" deep. The front cab intermediate step shall measure a minimum 33" wide x 8-1/2" deep.

The crew cab first step shall measure a minimum of 26-1/2" wide x 9-1/2" deep. The crew cab intermediate step shall measure a minimum 28" wide x 9-1/2" deep.

The cab shall meet or exceed cab impact test (SAE J-2420, cab rollover test (SAE J2422), and cab seating requirements (FMVSS 210, and FMVSS 208).

The cab shall include 4 doors. They shall have a front two (2) cab doors shall have a minimum clear opening of 42.5" wide by 81" high measured from the top of the lower cab step to the top of the door opening.; and the rear two (2) crew doors shall be a minimum clear door opening of 38.5" wide by 89" high measured from the top of the lower cab step to the top of the door opening. The length of the door will vary depending on door type.

ROOF STYLE - 8" RAISED

The cab roof design shall incorporate an angled front roof, transitioning into a rolled extrusion for a swept back design.

The roof height shall feature an 8" raise starting over the driver and officer positions and continuing back to the roof and rear wall joint. Raised roof designs that do not include a raised portion over the driver and officer positions will not be acceptable. No Exceptions.

The roof of the cab shall feature dual .25" thick interlocked structural member extrusions running the entire width of the cab defending against buckling in the event of a rollover.

The cab header shall feature dual 6061-T6 aluminum extrusions which shall offer superior rigidity and strength.

The raised roof shall offer a crew head height area of 63-1/2" from the floor to the ceiling in the crew areas for optimum headroom.

The crew roof super structure shall include a reinforcement hat-section structure 1/8" thick 5052-H32 aluminum bracing. The for-aft support braces will be 24" on center apart, the side to side support braces



will stretch from cab side to cab side and centered between the dual 3/16" extruded and plate reinforced roll-cage section.

The forward cab roof section shall include a combination of 1/8" 6061-T6 extruded tube reinforcements and a hat-section structure 1/8" thick 5052-H32 aluminum bracing. The bracing shall wrap the entire perimeter of the cab forward roof, and the condenser support structure.

The condenser support structure shall include 1/8" triple sections, supporting the outer perimeter and center of the condenser mounting pad.

Additionally, the entire roof super structure is reinforced by a .25" thick roof edge corner extrusion around the entire cab perimeter.

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

DRIVER SIDE EMS COMPARTMENT

The driver side of the cab shall feature a compartment which is designed for housing emergency medical equipment. The compartment shall be located immediately behind the driver's seat and the interior shall measure 22.75" wide x 36" tall x 24.25" deep (measured from the exterior door) and shall feature:

- A clear door opening of 16.5" wide x approximately 36" tall
- The compartment floor shall be a sweep out design with a minimum of 11.5 cubic feet of storage. No Exceptions

DRIVER SIDE EMS COMPARTMENT – No Exterior Access

INTERIOR DRIVER EMS COMPARTMENT ACCESS

The interior driver's EMS compartment shall have an opening of 19"W and as tall as possible. The compartment shall have a sweep out design. Compartment with a lip along the bottom shall be not accepted. No Exceptions.

EMS COMPARTMENT INTERIOR ACCESS

The driver EMS compartment shall feature interior access through a ROM roll up door towards the rear of the cab.



DRIVER EMS COMPARTMENT INTERIOR FINISH

The interior of the driver side EMS compartment shall be finished with the same product and color as the cab coating.

DRIVER EMS CAB COMPARTMENT LIGHTING

The driver's side EMS compartment shall include one (1) 18" strip of LED lighting and shall be located in the inside front corner of the compartment near the door.

OFFICER SIDE EMS COMPARTMENT

The officer side of the cab shall feature a compartment which is designed for housing emergency medical equipment. The compartment shall be located immediately behind the officer's seat and the interior shall measure 18.5" wide x 36" tall x 22.75" deep (measured from the exterior door) and shall feature:

- A clear door opening of 16.5" wide x approximately 36" tall
- The compartment floor shall be a sweep out design with a minimum of 8.8 cubic feet of storage. No Exceptions

OFFICER SIDE EMS COMPARTMENT – NO EXTERIOR ACCESS

INTERIOR OFFICER EMS COMPARTMENT ACCESS

The interior Officers EMS compartment shall have an opening of 19"W X as tall as possible. The compartment shall have a sweep out design. Compartment with a lip along the bottom shall be not accepted. No Exceptions.

EMS COMPARTMENT INTERIOR ACCESS

The officer EMS compartment shall feature interior access through a ROM roll up door towards the rear of the cab.

COMPARTMENT SHELF

{Quantity} adjustable shelf shall be installed in the interior cab compartment. The shelf shall be constructed from aluminum.



OFFICER EMS COMPARTMENT INTERIOR FINISH

The interior of the officer side EMS compartment shall be finished with the same product and color as the cab coating.

OFFICER EMS CAB COMPARTMENT LIGHTING

The officer's side EMS compartment shall include one (1) 18" strip of LED lighting and shall be located in the inside front corner of the compartment near the door.

CAB DOORS

The cab shall include a total of four (4) doors, two (2) forward and two (2) rear crew doors.

The forward cab doors shall be a minimum of 45" wide, and have a cab structure opening of 42.5" wide; and the rear crew doors shall be a minimum of 41" wide, and a cab structure opening of 38.5" wide to provide enhanced entry and egress of the cab.

All cab doors shall open a minimum of 80 degrees for the safety of personnel during entrance or egression from the cab.

Each cab door shall feature:

- Superior strength and rigidity from 3/16" closed section extruded door frames
- Insulation and damping inside each door for a solid feel and minimized reverberation when closed
- A rolled rubber bulb seal style gasket shall be utilized around the door ensuring a weather tight fit
- Integrated, mechanical door stop
- A full length, hidden piano style 10-gauge stainless steel door hinge with a 1/4" pin, which shall be mounted inside the panel of the door prohibiting dirt and debris from becoming trapped in the hinge
- An integrated one-piece inner door assembly that includes a glass track, mounting provisions for window regulator, door handle and door panel shall be utilized. The inner door assembly shall be easily removed with nut inserts. Self-tapping screws shall not be acceptable.

CAB STEPS

The cab steps shall meet NFPA 13-7.3 in size and slip resistance requirements.



The cab shall incorporate a two-step design at each door, with a first step height of approximately 22" from the ground. The leading edge of the first step shall be 5" further outboard than the second step to provide a staircase design for safer egress.

The front cab first step shall measure a minimum of 32" wide x 9-1/2" deep. The front cab intermediate step shall measure a minimum 33" wide x 8-1/2" deep.

The crew cab first step shall measure a minimum of 26-1/2" wide x 9-1/2" deep. The crew cab intermediate step shall measure a minimum 28" wide x 9-1/2" deep.

The top crew step shall incorporate an angle approximately midway from the rear wall to the crew door hinge extending out the flooring under the rear facing outer seat positions, offering foot placement for safety while seated in this position.

CAB STEP TRIM

The cab steps shall include a 12 gauge 304 Grip Strut stainless steel construction on the first step, the step closest to the ground. The stainless steel finish shall be a number 7 mirror. The step shall include a frame which is integral with the construction of the cab for rigidity and strength. The Grip Strut shall allow water and other debris to flow through rather than becoming packed under the step. The middle step shall be integral with the cab in construction and shall be trimmed in 3003-H22 embossed aluminum tread plate which is 0.084" thick.

BARRIER FREE DOORS

The cab doors shall be "barrier free" style, meaning the door shall be constructed to cover the entry down to the intermediate step, leaving the bottom step open. Each door shall provide approximately 33" of clearance from the ground to the bottom of the door so the door may be opened without stopping due to guard rails along highways.

The lower step well of the cab shall be painted job to match the lower primary color of the cab.

CAB STEP TRIM KICKPLATE

The cab step risers at all doors, the vertical section of all steps, shall include an aluminum tread plate finish.

Flared at the bottom



DOOR HANDLES

The exterior door handles shall be constructed of die-cast steel and chrome plated for a pleasing appearance. They shall feature a vertically oriented heavy duty pull style handles which are extended out and suitable for easy grasping with a gloved hand.

The interior door handle shall be a chrome plated paddle style latch. The paddle shall be hinged towards the front of the cab and shall include a manual door lock unless otherwise specified.

Each door latch shall feature a military grade aligning dove tail guide striker assembly for precision door closure which prevents sagging throughout the life of the vehicle. No exceptions.

CAB DOOR LOCKS

All cab doors shall include power and manual door locks with keys. The door lock shall include a manual toggle and shall be an integral part of the interior door handle which is red in color. The exterior door lock is integral with the door latch. The cab doors may be unlocked from the exterior with a key or through a thumb turn from inside the cab.

POWER DOOR LOCK OPERATION

Each powered door lock shall be activated by a switch on the Driver and Officer interior front grab handle; which shall control all of the powered cab entry door locks.

ADDITIONAL KEY FOB

The apparatus shall have one (1) additional key FOB, for a total of three (3) key FOBs.

POWER DOOR LOCK ACTIVATION

The power entry door locks shall include an electronic door lock system which shall include one (1) external keypad located near the Driver's side front door.

The power door locks shall include two (2) key fobs for activation of the power entry door locks.

INTERIOR CAB DOORS

All cab doors shall consist of a one-piece formed and stamped aluminum interior panel. The panel shall include a formed collar around the interior door latch. ABS material shall not be acceptable. No Exceptions.



INTERIOR CAB DOOR FINISH

All cab doors shall be finished with Line-X bed liner coating for durability. The finish shall be black in color.

INTERIOR FRONT DOOR PULL

The interior driver and officer cab doors shall each include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

The single piece door pull shall have a curved designed in an "L" formation to provide multiple points for grasping with a gloved hand. The horizontal dimension shall be a minimum of 28" and the vertical dimension shall be a minimum of 20". The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. No Exceptions.

The door pull shall feature secure mounting in three separate locations of the pull utilizing stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a black powder coated finish.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum grab handle shall be provided on the inside of each rear crew door. The handle shall extend horizontally the width of the window just above the windowsill. The handle shall assist with entry and egress from the crew area of the vehicle.

The interior driver and officer rear cab crew doors shall include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. No Exceptions.

The door pull shall feature secure mounting with stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a black powder coated finish.



WINDSHIELD

A one (1)-piece, safety glass full width windshield with more than 3,228 square inches of area will be provided. No Exceptions.

The windshield shall feature:

- A completely uninterrupted view from both the driver and officer positions
- The windshield will consist of three (3) layers; the outer layer, the middle safety laminate, and the inner layer. The .114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage.
- Economical replacement readily available from auto glass supplier
- Easily removable for replacement using standard automotive techniques
- A frit band will be provided along with an outer trim seal on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPER SYSTEM

A single windshield wiper system shall be incorporated in conformance with FMVSS and SAE requirements. Two (2) 22" windshield wiper arms shall be mounted below the windshield. Each arm shall include a 26" long wiper to provide optimum windshield clearing.

The windshield wiper fluid reservoir can be filled without raising the cab.

WINDSHIELD WIPER ACTIVATION

The windshield wipers shall be activated through a switch on the driver's panel, with intermittent control.

POWER WINDOW - DRIVER'S DOOR

The driver's door shall include a window which measures a minimum of 25.5" wide x 21" high with a minimum clear viewing area of 694 square inches. The glass shall include a standard automotive tint and through a powered operation shall completely roll into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to prevent water from entering the cab when closed.



POWER WINDOW

The Driver shall have switches for each of the cab door windows and the officer and each respective crew door powered window shall be activated by a switch on the respective door.

The switches for the driver and officer door windows shall be located in a customized door grab handle. No Exception.

POWER WINDOW - OFFICER'S DOOR

The officer's door shall include a window which measures a minimum of 25.5" wide x 21" high with a minimum clear viewing area of 694 square inches. The glass shall include a standard automotive tint and through a powered operation shall completely roll into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to prevent water from entering the cab when closed.

REAR DRIVER SIDE WINDOW

The rear driver's side crew door shall include a window measuring 26.75" wide x 21.75" high with a minimum clear viewable area of 581 square inches. The glass shall include a standard automotive tint and through power actuation shall roll completely into the door housing. The power window shall be activated through a switch located on the top of the door panel.

REAR OFFICER SIDE WINDOW

The rear officer's side crew door shall include a window measuring 26.75" wide x 21.75" high with a minimum clear viewable area of 581 square inches. The glass shall include a standard automotive tint and through powered actuation shall roll completely into the door housing.

DRIVER REAR CAB WINDOW GLASS

The cab shall include a fixed driver's side window glass which shall be located at the rear of the cab behind the rear doors. The glass shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal when closed.

OFFICER REAR CAB WINDOW

The cab shall include a fixed officer's side window which shall be located at the rear of the cab behind the rear doors. The glass shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal when closed.



CAB INSULATION

The cab shall be completely insulated from road and vehicle resonance, exterior sound and thermal intrusion.

The cab insulation system shall be comprised of three separate components each designed to assure optimal thermal and acoustic properties are achieved. Two layers of insulation material shall be utilized in conjunction with a .2" air barrier.

The cab shall utilize at a minimum 10 mils of flexible extensional visco elastic vibration damping insulation offering excellent acoustic reduction properties.

A minimum of .8" of SCbond Polyurethane Foam insulation shall be applied as an additional insulation between the cab skin and all interior ceiling surfaces. The insulation shall have a density of 10 lb/ft³ +/- .5 providing better thermal properties and acoustic reduction properties.

The interior cab insulation system shall ensure that no seated position within the cab exceeds 72dB as certified by the manufacture. This decibel rating shall be measured with the apparatus traveling 45 mph with climate control settings off.

All insulation used in the construction of the cab shall be marine grade featuring longevity and resistance to degradation.

Use of open cell material as the primary insulation will not be acceptable. No exceptions.

The interior of the cab including the rear wall and ceiling panels shall be insulated.

Use of open cell material as the primary insulation will not be acceptable. No exceptions.

ENGINE TUNNEL INSULATION

The engine tunnel shall include an insulated barrier from noise on the underside of each tunnel surface. This barrier shall be engineered for surrounding engines.

The insulation barrier shall provide an acceptable decibel level within the cab meeting or exceeding the recommendations of NFPA 1901.



The thickness of the engine tunnel insulation shall be 1" thick. The insulating material shall be open cell polyether based foam with a textured surface, specifically designed for acoustic absorption.

Use of aluminized faced material on the engine tunnel shall not be acceptable. No exceptions.

The engine tunnel insulation shall be precisely cut and sealed to fit each segment on the underside of the tunnel surface. The insulation shall then be affixed by a pressure sensitive adhesive.

The insulation shall meet or exceed FMVSS 302 flammability testing.

CAB UNDERBODY INSULATION

The underside of the cab shall include at a minimum of 1" of a uni-seal Cab-Foam insulation offering reducing vibration noise and thermal effect to the interior of the cab.

DAMPING INSULATION

The entire cab, including the ceiling and walls shall include additional insulation reducing structure borne noise from vibration, impact and resonance within the cab.

INTERIOR TRIM MATERIAL

The interior trim shall feature a 31 oz. marine grade vinyl which features a tensile strength of ASTM D751 of excellent, tear strength meeting the Federal standard 191-5134 of excellent and shall be oil resistant passing the CID-A-A-2950A requirement for no permeation.

Due to the excellent qualities of the marine grade vinyl material, no other type of interior trim shall be acceptable. No Exceptions.

The soft trim vinyl shall feature mildew resistance passing ASTM G21-90 and shall be rated to -25 degrees Fahrenheit.

The vinyl shall be flame retardant meeting California Fire Code 117, UFAC Class 1, and BIFMA Class 1 and shall have a high resistance to abrasion.

The interior of the cab including the ceiling panels shall feature this soft trim and shall be black in color.

REAR WALL INTERIOR MATERIAL

The rear wall of the cab shall be covered in black 31 oz. marine grade vinyl for a more pleasing appearance.



FLOOR MAT

The interior flooring of the cab shall be covered with an advanced black multi-layer acoustic dampening mat. The floor matting shall be an open/closed cell, flexible polyurethane polyamide material with frictional dampening and dissipation properties. The mat shall be a fire and skid resistant non-wicking material.

SUN VISORS

The driver and officer seats shall feature a sun visor mounted in the header over each seating position. The sun visors shall be padded and trimmed in black vinyl.

Cab Coating Interior Color

INTERIOR CAB FINISH

The interior cab shall be finished in Line-X bed liner coating including the interior A, B, C and D pillars, all occupant seat frames and any surrounding surfaces extending to the ball seal around each door. This type of coating shall feature:

- Durability, scratch, chemical and abrasion resistance
- Consistent, even coverage and a uniform texture
- Resistance from fading from exposure to UV light
- Black in color

ENGINE TUNNEL

The distance from the back of the tunnel to the interior wall shall be 56" measured at floor level and 62" at top of engine tunnel. No Exception.

CAB DASH

The cab dash shall offer heavy duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.



ABS polymer construction shall not be acceptable. No Exceptions.

The cab dash shall offer a finish of a polyurethane coating for a rugged design and finish. No Exceptions.

The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

This construction shall allow for a clean, seamless dash area that shall reduce unnecessary joining of cab dash components. This design allows for the following features:

- Optimal heating and cooling of cab occupants, HVAC louvers shall be integrated into the gauge panel with a total of six (6) louvers; three louvers pointing at the driver and three louvers pointing at the officer.
- The cab dash instrument cluster shall be installed on a painted panel. This panel shall provide for easy removal to increase serviceability and provide ease of maintenance.
- For improved safety cab switches and controls shall be ergonomically located within easy reach of the driver when in the seated position with seatbelts fastened. This design will reduce driver distraction and increase safety by putting frequently accessed driver controls within easy reach to allow the driver more time to focus on the road.
- The officer side cab dash shall have a painted fire service grade RTM composite fiberglass panel that shall house the three HVAC louvers on the officer side. This panel will also provide ergonomically located switches and controls for the officer. All controls shall be within easy reach while in the seated position with seatbelts fastened.
- Access panels on the top of the dash for both the driver and officer sides easing maintenance access to controls, components and gauge assemblies
- The driver side dash shall include gauges for primary air pressure, secondary air pressure, a Pacific Insight instrumentation gauge panel and the DEF gauge as standard
- The driver side dash shall also include two (2) lower panels to the left and right of the steering column for FMVSS switches such as the Off/Ignition and start switches and the park brake assembly



- The driver dash shall include a panel for inclusion of an optional Weldon Vista screen and six (6) additional switches or the HVAC controls and additional switching to the right of the Driver
- The officer dash shall include a recessed area for optional mounting cradles or brackets for a laptop computer, mobile data terminal, map compartment or clip board
- The officer dash shall include a panel for inclusion of an optional Weldon Vista screen and or provisions for switches and gauges to the left of the Officer

ENGINE TUNNEL

The engine tunnel shall be constructed of aluminum offering superior durability in addition to thermal and acoustic resistance. Covering the engine tunnel shall be a layer of formed composite material for a contoured transition into the dash and offering a pleasing appearance.

The tunnel shall feature a polyurethane coating which shall match the dash and header in texture and color for a consistent appearance and robust finish with a thickness of approximately .28".

The engine tunnel shall feature:

- A low profile design measuring approximately 46.5" wide and 23-1/2" in height from the crew floor shall offer optimum visibility of the windshield and cab interior from any seated position. No Exception.
- The engine tunnel at the driver's position shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 25.5" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 33".
- The engine tunnel at the officer's position shall be a tapered design, featuring 22-1/2" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 24" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 31-1/2".
- The design shall offer a minimum of 30" for the driver and 28-1/2" for the officer as measured from the inside door pan to the top edge of the tunnel. The dimension measured at the "H" (hip) point, with the seat in the lowest position, shall be a minimum of 28-1/2" for the driver and 27" for the officer. No Exception.
- Recessed sections for ease of mounting equipment at the rear of the tunnel or for compartments and bases which can be used for installing Fire/EMS equipment and components such as flashlights and light boxes



CAB DASH & ENGINE TUNNEL

The cab dash and the engine tunnel of the cab shall be coated with Line-X bed liner coating for a durable finish. The color shall be black.

MODULAR CENTER DASH CONSOLE

The dash and front portion of the tunnel shall include an angled modular console centered between the driver and officer positions.

The console shall feature:

- A heavy duty housing constructed from 14-gauge steel which is powder coated with a durable semi-gloss textured black finish to provide glare and corrosion resistance
- The console top constructed of black anodized aluminum extruded rails which allow for mounting brackets, plates, and other console options
- Integral nut tracks which allow mounting of equipment to the sides of the console by way of sliding 1/4"-20 hex nuts
- A hinged lid constructed from 16-gauge steel also powder coated for corrosion resistance
- The availability of pre wiring for specific components
- A modular design for ease of changes and future additions such as changing out brands of radio, types of sirens or adding accessory space

The console shall offer an available eight (8) zones configured with mounting plates for optional components as shown below:

MICROPHONE TABS

Two (2) black mounting plate(s) containing mic tabs shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

Mic Tabs shall be mounted as per the PDF drawing included in production specifications.



BLACK MOUNTING PLATE

One (1) black mounting plate(s) containing blank plates shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

BLACK MOUNTING PLATE FOR RADIO

Two (2) black mounting plate(s) containing radio mounting shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

BLACK MOUNTING PLATE FOR POWER POINTS

One (1) black mounting plate(s) containing two (2) 12-volt power points shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED ACCESSORY BOX

Two (2) black mounting plate(s) containing an open accessory box shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED CUP HOLDER

Two (2) black mounting plate(s) containing two cup holders shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED SIREN

One (1) black mounting plate(s) containing mounting for a siren shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

Whelen 295 HFRS



CONSOLE MOUNTED TRAFFICE LIGHTBAR CONTROLLER

One (1) black mounting plate(s) containing a plate to mount the traffic advisor lightbar controller shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

Whelen TAL65

INSTRUMENTATION PANEL

The instrumentation panel inlay shall be painted a gloss black.

CAB HEADER

The cab header shall offer heavy duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable. No Exceptions.

The cab header shall offer a finish of a polyurethane coating for a rugged design and finish. No Exceptions.

The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

The cab header shall also be purpose built for integration of Fire/EMS components and ease of maintenance with panels above both the driver and officer positions measuring 8" wide x 15" long for mounting radios, aerial controls and switches.

HVAC HEATING AND COOLING SYSTEMS

The interior cab climate control shall be comprised of a triple system that shall include a defroster, a cab and crew heater and air conditioner for a complete HVAC system. The air conditioning system shall be



comprised of compressor, condenser, and a minimum of three (3) evaporators to provide consistent temperature control throughout the entire cab.

The system shall be rated as an Emergency Vehicle grade for the use in Fire and Rescue style vehicles and shall provide environmental air treatment in accordance with published SAE standards.

The HVAC system shall be tested and certified by the component manufacturer and a third party independent certified testing laboratory, including all three systems. Documentation of test results shall be provided with the bid. No Exceptions.

The HVAC system shall be a total and complete system, and shall provide sufficient defrosting, heating and cooling to the entire cab. The HVAC system shall meet or exceed all specified items without the use of auxiliary heating and cooling systems.

DEFROSTING SYSTEM

The defrosting system shall feature:

- To provide maximum defrost and heating performance, a 30,000 BTU heater-defroster unit with 780 CFM of air flow will be provided inside the cab.
- The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable cover will be installed over the defroster unit.
- Mounting under the dash with fresh air intake providing excellent defrost and demist capabilities. Systems not utilizing fresh intake shall not be acceptable. No Exceptions.
- Six (6) vents shall be located in the top forward portion of the dash for superior defrosting properties across the entire windshield.
- The system shall be capable of clearing 90 percent or more of the windshield in fifteen (15) minutes or less after a three (3) hour cold soak at 0 degrees Fahrenheit (-17.78 degrees Celsius).
- The system shall exceed Flash Fogging standards that are set forth in the SAE Heavy Duty Cab with Sleeper specifications. Documentation from a third party testing facility shall be available upon request. No Exception.
- The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the one (1) piece windshield.



HEATING SYSTEM

The heating system shall feature:

- Delivery of a minimum of 82,000 BTU/hour of heat to the entire cab.
- Heat and air circulation shall be provided to the driver and officer foot area of the cab as standard through ducting in the foot well area of both positions. No Exception.
- Substantial air movement and heating provided to the driver and officer's position, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers directed at the driver and three (3) adjustable louvers directed at the officer
- Dual overhead units, with five (5) adjustable louvers shall be mounted above the rear facing seat positions on the driver and officer side of the cab
- A minimum of 880 CFM of air flow measured at the front seated positions and 1580 CFM of air flow per side in the rear seated positions for a combined total of 4040 CFM of air flow in the cab. No Exceptions.
- The heater shall be plumbed with a shut off valve at the engine, so that the coolant bypasses the heaters.
- The heater hoses used will be silicone high heat heater hose.

AIR CONDITIONING

The air conditioning system shall feature:

- A minimum of 96,000 BTU/hour of cooling capacity to the entire cab.
- One (1) evaporator shall be located under the center dash and Two (2) crew overhead evaporators located near the B-pillar on each side of the cab allowing for greater frontal visibility for the forward facing crew seating and allowing for more interior mounting of accessories.
- A gravity condensation drain system shall be utilized. These drains shall remove all condensation from the evaporator units and direct it to the exterior of the chassis cab for optimal performance. Systems utilizing pumps to remove condensation, or gravity systems with poles or other obstructions located within the cab to route drains through shall not be acceptable. No Exceptions.



- Substantial air movement for optimum cooling shall be provided to the driver and officer positions, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers shall be directed at the driver and three (3) adjustable louvers shall be directed at the officer
- The air condition system shall be capable of cooling the cab from 110 degrees Fahrenheit (43.33 degrees Celsius) to 70 degrees Fahrenheit (21.11 degrees Celsius) at 80% humidity in less than 30 minutes with an engine RPM of 1200; after a three (3) hour heat soak. A certification document from the testing facility shall be available upon request. No Exception.

Proposals offering ceiling mounted evaporator units in the center of the cab above or on the engine tunnel shall not be accepted as this is a safety consideration due to the lack of visibility and communication within the cab.

CAB PAINT AIR CONDITIONING CONDENSER COVER

The air conditioning condenser cover shall be painted to match the roof color.

HEATER HOSE INSULATION

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

The Heater Hoses on the Chassis and up to and under the Cab shall be insulated

CONDENSER

The cab air conditioning system shall include one (1) low profile HE-condenser which shall be centered forward on the roof of the cab.

HEATING AND COOLING CONTROLS

The HVAC system shall be controlled from the center dash through three (3) turn style knobs for the temperature control, the fan control and for the mode. Fan controls shall also be available to the rear crew area.

REAR CREW ARE CONTROLS – FORWARD FACING DRIVER'S SIDE

The controls for the crew area heat shall be mounted overhead, along the ceiling. The final location shall be determined at the preconstruction.

The rear HVAC controls shall be mounted overhead and above the center forward facing seat in the 415DS Location.



4-FRONT AIRBAGS AND ROLLTEK

4-FRONT AIRBAGS

The Apparatus shall be equipped with a safety system designed to protect occupants in the event of a rollover or frontal impact and shall include IMMI's RollTek and 4-Front.

The 4-Front system shall provide protection during a frontal or oblique impact event. The system shall activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The frontal sensor that will make this determination has been calibrated through extensive testing to optimize the timing for firing the 4-Front system.

The 4-Front system shall deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag
- Officer side knee air bag
- Seat Belt Buckle pre-tensioners

ROLLTEK

The Apparatus shall be equipped with the IMMI RollTek system which will provide protection during a slow or fast 90-degree rollover. The system shall analyze the vehicle's angle and rate of roll to determine the exact time for optimal protection.

This system shall include the following:

- Driver and Officer Inflatable Tubular Structure (ITS)
- Crew seats shall be equipped with an (SRA) Side Rollover Airbag on all outboard seating positions
- All seat belts shall also have a buckle pre-tensioner to tighten the belts down to maximize protection of the occupant (no exception)

The driver side air bag shall be mounted inside the steering wheel and shall be designed to protect the head and upper torso of the Driver, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact. The officer side knee bolster air bag shall be mounted in the panel below the officer dash and will be designed to protect the legs of the Officer, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact.

In the event of a frontal or oblique impact, the system shall deploy the front driver and officer air bags, and activate the seat belt pre-tensioners on suspension seats to restrain the seat in the lowest travel position. Seat belts will firmly hold both occupants in place.



The cab and chassis design shall have been subjected to a 21 MPH crash impact during frontal and oblique impact testing. Testing shall include all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspension components, frame rail cross members, engine and transmission and their mounts, frame extensions and body mounts. The testing shall provide configuration specific information used to optimize the timing for firing the air bags.

SEAT AND SEAT BELT COLOR

This seat in the cab shall be black in color with a red seat belt.

DRIVER SEAT-RollTek

The driver's seat shall be a H. O. Bostrom Sierra high back reclining ABTS bucket seat with Air-50 Suspension. The seat shall have contoured, high-density cushions with lumbar support. The seat cushion shall be supported with a serpentine spring suspension. The back recline shall include a locking mechanism on both sides of the seat and shall have a release handle located at the retractor side of the seat assembly. The seat shall have a double-locking five-inch fore and aft adjustment and Occupancy sensor in the seat cushion. The seat shall include a pneumatic suspension with 3" of vertical ride range adjustable with a molded switch located on the retractor side of the seat assembly. The suspension shall be internally tethered and shall not require secondary tethers from the suspension to the cab structure.

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

SEAT BACK

The seat back shall incorporate a standard style headrest.

HEAVY DUTY SHOCK ABSORBER

A heavy duty shock shall be added to the air ride seat.

SEAT MOUNTING DRIVER

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

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.

SEAT BACK LOGO

The seat back shall include the “Rosenbauer” logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

DRIVER SEAT BOX STORAGE COMPARTMENT

There shall be a storage area under the driver’s seat. The compartment shall be 21.25 inches wide, 22.50 inches long, and 6.25 inches high. The access opening shall be 12.00 inches wide and 4.50 inches high.

ALUMINUM ACCESS DOOR

There shall be an aluminum door cover provided for the driver and officer seat compartment. The door shall be coated to match the interior of the cab, and it shall be equipped with a piano style hinge and a manual latch.

OFFICER SEAT-RollTek

The officer's seat shall be a H. O. Bostrom ABTS(All Belts To Seat/Integrated Seat Belts) series high back reclining with fixed base. The seat shall have contoured, high-density cushions with lumbar support. The seat cushion shall be supported with a serpentine spring suspension. The back recline shall include a locking mechanism on both sides of the seat and shall have a release handle located at the retractor side of the seat assembly.

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

SCBA SEAT

The seat shall be an HO Bostrom Tanker 450 series seat. The seat shall include an SCBA storage area with one-piece flip-up headrest with spring return. The seat shall include two-part bolster padding with removable insert to accommodate SCBA's with rigid waist belts.

SEAT BACK

A SecureAll™ SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket



shall be easily adjustable 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
- A 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.

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.

SEAT BACK LOGO

The seat back shall include the “Rosenbauer” logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

OFFICER’S SEAT BOX STORAGE COMPARTMENT

There shall be a storage area under the officer’s seat. The compartment shall be 19.75 inches wide, 17.50 inches long, and 6.25 inches high. The access opening shall be 9.00 inches wide and 4.50 inches high.

FORWARD FACING CENTER SEAT-RollTek

{Quantity} forward facing center crew seat shall be a H. O. Bostrom ABTS (All Belts To Seat/Integrated Seat Belts) series high back seat with fixed base. The seat shall have contoured, high-density cushions with lumbar support and Occupancy sensor in the seat cushion. The seat cushion shall be supported with a serpentine spring suspension.



The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

The seat shall have an integrated belt pretension (IBP) device.

SCBA SEAT

The seat shall be an HO Bostrom Tanker 450 series seat. The seat shall include an SCBA storage area with one-piece flip-up headrest with spring return. The seat shall include two-part bolster padding with removable insert to accommodate SCBA's with rigid waist belts.

SEAT BACK

A SecureAll™ SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable 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
- A 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.

SEAT MOUNTING FORWARD FACING CENTER

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

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.

SEAT BACK LOGO

The seat back shall include the “Rosenbauer” logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT FRAME FORWARD FACING ENCLOSED

The forward facing center seats shall include an enclosed seat frame which is located and installed on the rear wall spanning its width.

The seat frame shall be constructed of no less than 5052-H32 .1620" thick aluminum plate.

SEAT COMPARTMENT FINISH

The seat frame shall be finished in a high performance polyurethane coating. The color shall be black.

EXTERIOR GRAB HANDLES

One (1) 18” anti-slip exterior assist handle shall be mounted behind each of the cab doors. The grab handle shall be constructed of aluminum and be 1.25” diameter with a knurled finish enabling non-slip assistance with a gloved hand and mounted on stanchions.

ADDITIONAL GRAB HANDLE

The cab face shall include a 11” aluminum grab handle mounted on stanchions which shall be mounted in the center of the cab face above the grille.

CAB FASCIA

The cab fascia shall offer a traditional, yet aggressive appearance, in its design and shall be constructed of work-hardened 5052-H32 aluminum. This design shall feature:

- A super structure which is fully welded to the cab, for a seamless and robust integration
- Thermoformed headlamp bezels, constructed of impact resistant, polycarbonate composite which is vacuum metalized to eliminate peeling and bubbling of a chrome type film or plating
- Traditional style headlight bezels with 4 x 6 high intensity headlights which shall add a classic look to the fascia while improving visibility



- The turn signal lights shall be located in the lower outboard portion of the head lamp bezel and a warning light in the lower inboard position

FRONT GRILLE

A prominent front grille shall punctuate the aggressive design of the cab with its outboard wing style warning light bezels and heavy framework. The front grille shall feature:

- Stamped steel construction for superior strength and durability
- Chrome plated for an aesthetically pleasing appearance
- Tilttable and/or removable mesh panel for fluid fill and fluid check access
- Two (2) 4" x 6" warning light locations in the upper wings
- Up to six (6) warning light locations along the mid bar for a variety of warning light combinations

LIGHT BEZEL

The front grille shall include wing light bezels. The bezels shall be constructed of a stainless material and shall be capable of holding two (2) 4" x 6" warning lights.

GRILLE LOGO

The front grille shall include a Rosenbauer logo.

FRONT GRILLE - UNITED STATES OF AMERICA FLAG INLAY

An American Flag shall be painted over the front grille honeycomb inlay, with a minimum of two (2) coats of clear coat to help protect the painted surface.

FLUID FILLS & CHECK

For ease of maintenance and access, the following fluid checks shall be located behind the tilttable and/or removable mesh panel:

- Engine Oil dipstick
- Engine Coolant Sight Glass



- Power Steering Fluid dipstick
- Windshield Washer Fluid

The following fluid fill shall be located behind the tiltable and/or removable mesh panel:

- Engine Oil
- Power Steering
- Windshield Washer

Proposals including access to fluid checks through the tunnel or by raising the cab shall not be considered.

HEADLIGHTS

A quadruple headlight assembly shall be provided in the fascia to enhance the look. The top two (2) bezels shall include head lamps while the lower bezels shall house a turn signal in the outboard position and a warning light in the inboard position.

FRONT TURN SIGNALS

Two (2) Whelen M6 LED square, front turn signal assemblies shall be included on the front fascia directly below the headlights, one each side of the cab grille. Each turn signal shall be mounted in an attractive façade style bezel which is an integral part of the fascia.

SIDE MARKER LIGHTS

Two (2) Weldon amber LED round, side marker light assemblies shall be mounted on the side of the cab ahead of the driver door, adjacent to the front head lamp bezel.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The head light and marker lights shall be activated through a switch on the driver's panel.

FRONT MARKER LAMPS

The cab front shall include five (5) LED amber marker lamps above the windshield in accordance with the Department of Transportation requirements.



CAB FENDERS

The cab wheel wells shall include full width, 14 gauge 304 polished, stainless steel cab fenders to resist corrosion and enable easier cleaning maintenance. The inner liner, measuring 18" wide shall be constructed of plastic with an outer fenderette measuring 2.5" wide.

COMMANDER LOGO

A COMMANDER logo shall be installed on each side of the chassis cab.

FRONT MUD FLAPS

The cab and chassis shall be provided with rubber front mud flaps.

AIR RIDE CAB AND CAB TILT SYSTEM

The cab shall be a full tilt style. A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

The dual lift cylinders shall lift the cab 45 degrees from a horizontal plane facilitating easy engine maintenance. The chassis engine shall be able to be removed if required without tilting the cab beyond 45-degrees.

The center line of the chassis cab tilt shall be a minimum of 76" from the center line of the front axle, providing a large corridor between the cab and front tire for maximum work space and accessibility to fan, fan belt, fan drive, air compressor, power steering pump, alternator and air filter.

The tilt angle shall allow access to the engine and area under the cab without contacting any components mounted to the gravel shield.

The cab shall include a four (4)-point cab pivot and mounting system; two of the points shall be rubber isolators, and the two rear mounts shall be air bag mounting system. The set of air bags will be installed and incorporated into each rear cab lock down mechanism. The air bags shall be connected to the chassis air system and include an air leveling valve that adds and releases air to maintain a level cab. The rear air bags shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics.

The front cab pivot assemblies shall be a 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.



The cylinders shall include blocking valves (velocity fuses) which prevent motion when no control buttons are pushed. In the event of a hydraulic system failure, the valves shall retain the fluid in the cylinders.

A redundant mechanical stay arm shall automatically be engaged once the cab has been fully raised. Before lowering the cab, this device must be disengaged using the stay arm control located on the driver's side rear of the cab, providing the operator protection from high engine exhaust temperatures. The stay arm shall be safety yellow for high visibility so that it is easy to see whether the arm is in place or not. No Exception

All mounting points shall be bolted directly to the frame rail.

The cab lift safety system shall be interlocked with the parking brake. The cab tilt mechanism shall be active only when the parking brake is set and the battery master switch is in the on position. If the parking brake is release, the cab tilt mechanism shall be disabled.

There shall be a manual pump incorporated in the event of a system failure to the cab tilt system.

A warning light shall illuminate in the cab instrument panel to indicate whenever the cab is not fully latched in the locked down position, and the parking break is release.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.

REARVIEW MIRRORS

The cab exterior shall include Ramco bus style mirrors, one (1) mounted on the Drivers' door and one (1) mounted on the Officer's side front cab corner radius below the windshield.

The Driver's side mirror shall be model CRM-310-1750-PHCHR. The mirror head shall be injection molded chrome plated ABS plastic that measures 9.5" wide x 17.5" high and is mounted with a polished die-cast aluminum arm.

The Officer's side mirror shall be model CRM-310-1752-A18-PHCHR. The mirror head shall be injection molded chrome plated ABS plastic that measures 9.5" wide x 17.5" high and is mounted with a 13" long polished cast aluminum arm.



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

REARVIEW MIRROR REMOTE ACTIVATION

The driver's panel shall include activation for the rearview mirrors remote function. The driver panel shall also include a switch activating the mirrors to be heated.

CAB TWO TONE PAINT

The cab surface shall be thoroughly washed with grease cutting solvent (PPG DX330) prior to any sanding. The cab surface shall then be sanded and minor imperfections filled and sanded. The prepared surface shall then be washed again with (PPG DX330) to remove any contaminants from all surfaces to be painted.

The first coating to be applied shall be a pre-treat epoxy primer (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats shall be a polyurethane primer resurfacing agent (PPG F4936). The film build shall be 4-6 mils when dry. The primer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure a maximum gloss finish. The last step shall be an application of at least three coats of PPG FDG polyurethane two-component color (single stage). The film build shall be 2-3 mils when dry. The single stage polyurethane shall provide a UV barrier to prevent fading and chalking.

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

CAB PAINT UPPER

The upper cab color shall be PPG white color and FDG914949 number.

CAB PAINT LOWER

The lower or primary cab color shall be PPG Red color and FDG 75664 number.

CAB UNDERCOAT

The cab shall have an undercoat applied prior to the cab being set on the running gear. The under coat shall be a waterborne, one-component, air dry undercoat formulated to prevent chipping, cracking and marring of painted or unpainted surfaces after exposure to high impact sand, gravel or other abrasive materials. It shall also have high corrosion resistance.



PAINT SPRAY OUT

The customer shall be supplied with a paint spray out for customer approval prior to the cab being painted.

FRONT AXLE

A Meritor MFS Easy Steer non-drive axle shall be incorporated as the front axle for the chassis. The axle shall feature:

- A capacity of 21,500 pounds
- A 3.74" drop and a 71" king pin intersection (KPI)
- A conventional style hub with a standard knuckle

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 SUSPENSION

The front suspension shall include a Hendrickson leaf spring suspension. The suspension shall feature:

- Capacity rating of 22,800 pounds
- 9 Leafs
- A Grease fitting
- Double wrapped front eye

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.

POWER STEERING GEAR WITH ASSIST

The power steering gear shall be a TRW model TAS 85 and shall include the following:

- A balanced, hydraulic, positive displacement, sliding vane power steering pump which is gear driven from the engine
- One-piece, 2" diameter drag link for maintaining consistent wheel alignment resulting in less maintenance.
- The steering gear shall be mounted on a plane that is at a 9-degree angle in relationship to the center plane of the chassis. This mounting technique is designed to reduce the operating angle of input steering shafts. A more direct, responsive, and smoother handling vehicle will result from these unique design characteristics.

A certified torque and geometry study by TRW shall be available upon request.

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 apparatus manufacturer.

Alignment documentation shall be available upon request.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 46 degrees to the left and right.

The manufacturer shall provide third party verification of cramp angle upon request from the fire



department.

FRONT TIRES

The front tires shall be Goodyear 425 65R 22.5 20PR “L” tubeless radial G296 mixed service tread.

The front tires shall feature:

- A stamped load capacity of 22,800 pounds per axle with a speed capacity of 68 miles per hour when properly inflated to 120 pounds per square inch
- A US Fire Service Intermittent usage load capacity of 24,400 pounds per axle.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch 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 a polished finish that lasts.

FRONT BRAKES

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

The front brakes shall include brake chambers supplied by Meritor and shall be approved per application.

STEERING WHEEL AND COLUMN

The cab shall include a Douglas Autotech steering column. The steering column shall feature an 18", four (4) spoke steering wheel located at the driver's position; a five (5) position tilt and 2.25" telescopic adjustment. The steering wheel shall be provided with a black vinyl cover with foam padding and a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

The chassis shall include dual electric 12-volt horn with a minimum 110 decibels.

REAR AXLE

A Meritor RS-26-185 driving axle shall be incorporated as the rear axle for the chassis. The axle shall feature:

- Rated capacity of 27,000 pounds



- Heavy duty Hypoid gearing for longer life, increased 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
- Rigid differential case for high axle strength and reduced maintenance
- Rugged Dependability
- Rectangular shaped, hot formed housing with a standard wall thickness at spring seat of .56” for extra strength and rigidity

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR SUSPENSION

The single rear axle shall feature a Hendrickson Firemaax™ air suspension. The suspension shall include two optimized air springs mounted to cast structural trailing arms, a transverse cross beam for increased roll stability and two heavy duty shock absorbers. Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load. Axle alignment is maintained using two eccentric bushings at each frame bracket.

The rear suspension capacity shall be rated at 27,000 pounds.

REAR BRAKES

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

The rear brakes shall include brake chambers supplied by Meritor and shall be approved per application.

REAR SHOCK ABSORBERS

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



REAR TIRES

The rear tires shall be Goodyear 12R 22.5 16PR “H” tubeless radial G622 RSD. The rear tires shall feature:

- A stamped load capacity of 27,120 pounds per axle with a speed capacity of 68 miles per hour when properly inflated to 120 pounds per square inch

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, heavy duty, 22.50 inch x 8.25 inch aluminum wheels. Each outer wheel shall have a polished aluminum finish on the exterior surface and each inner wheel shall have a machine finish. The wheels shall be forged from a single piece of aluminum which shall be corrosion resistant, engineered to be lightweight and provide exceptional performance. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

VALVE STEM EXTENSION - SINGLE AXLE

To allow for easy checking and inflation of the rear inner tire it shall be equipped with a multi-layer valve stem extension, the layers shall be as follows: starting from the inner to out layer, stainless steel metal core, air tube, stainless steel jacket, protective color.

VEHICLE TOP SPEED

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

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 minimum 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. The system shall include an anti-compounding feature. 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. 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 lose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

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.

The Meritor Wabco ABS and ESC system shall come with a three (3) year/300,000 mile parts and labor warranty.

MUD / SNOW SWITCH

A momentary switch shall be provided and properly labeled "mud/snow". The switch shall be a rocker switch on a point to point truck or in the Vista on a V-Mux truck. 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.

AIR TANK BRACKETS & STRAPS

The air tank(s) shall be mounted to the frame rail with brackets that are hot dipped galvanized thereby creating a barrier and cathodic protection from corrosion, and eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after a period of time due to nicks, chips and corrosion. Powder coated or painted air tank brackets shall not be accepted. No exception.

All of the air tank straps shall be plastic coated stainless steel cable. No Exception.



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 system shall include an anti-compounding feature.

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 driver's side dash to the right of the steering column within easy reach of the driver.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 Plus air dryer with an integral 100 watt heater with a Metri-Pack sealed connector. The system shall have an integrated purge volume and integrated governor.

The system shall have the following features:

- Premium desiccant provides greater water adsorption
- Replaceable spin on cartridge for simple maintenance
- Compact light weight design
- Pressure relief safety valve
- Turbo cut-off valve for boosted compressor applications
- Service components are external for easy replacement
- Common service components proven for reliability and quality
- Integrated with the air governor.



MOISTURE EJECTORS

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

AIR SUPPLY LINES

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

The air tanks shall be painted to match the color coded lines. If a split tank is used, each portion of the tank shall be painted to match the function.

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

The electrical looms running inside the frame rails shall be separated from the air lines.

AIR HORN RESERVOIR

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

FRAME

The chassis frame shall consist of two (2) "C" style parallel rails, constructed of high strength low alloy and shall feature the following:

- A Stenx **MODEL 110XF** 10.19" high by 3.63" deep cold rolled steel frame or equivalent.
- .38" thick flange
- Inner channel measuring 9.31" high x 3.25" deep x .25" thick
- The 10.19" frame height shall be maintained throughout the entire length of the frame to allow for maximum storage capacity for the entire apparatus.
- If frame rails that are larger than those specified are to be utilized, the maximum height of each frame rail shall not exceed 10.25" at any point on the frame rail. This will ensure the lowest possible vehicle center of gravity allowing maximum stability as well as providing the lowest body height possible.
- Frame rail shall have a consistent frame web throughout the entire length.
- The entire frame rail design shall be manufactured in the United States of America and readily available on the aftermarket.
- Grade 8 Structural fasteners, Huck bolts shall not be acceptable. No Exception.



- The hardware used for the chassis shall be are to be corrosion resistant. The process shall be dip-spin-bake coated with two coats of zinc/aluminum metal flake coating in an inorganic binder. Coating one is to be zinc flake and coating two is to be aluminum flake. The zinc flakes sacrificially corrode to protect the base metal. The aluminum flakes prolong the life of the zinc. Salt fog test life, based on ASTM B117 on unassembled fasteners, is 1000 hours to red rust. The same test on assembled fasteners is 750 hours to red rust. The two step coating is RoHS compliant as it eliminates the hexavalent chromium used in the passivation of electroplated zinc coatings to create yellow zinc(zinc dichromate). The elimination of the zinc plating also greatly reduces the likelihood that hydrogen embrittlement will occur. Hydrogen embrittlement is a side effect of electroplating that reduces toughness and can lead to fracture. No Exception
- Manufacturer's lifetime warranty

The frame ratings shall be as follows:

- 110,000 PSI minimum yield strength high strength low alloy steel
- Minimum Resisting Bending Moment (RBM) of 2,810,000 inch pounds per rail

To avoid frame cracking and failure over time, the top flange of the frame adjacent to the engine installation shall have a tapered design. Notches for engine components shall not be accepted due to fatigue and the potential for cracking. No Exceptions

UNDER FRAME REINFORCEMENT

An under slung frame reinforcement shall be installed below the frame rails in the transmission area to increase the vertical rigidity of the frame.

The under frame reinforcement provides:

- Enhanced handling
- Improved ride quality
- Increase resistance to frame and cross member fatigue
- Enhanced vehicle stability providing improved safety to occupants

CROSS MEMBERS

There shall be a minimum of seven (7) steel plate cross members installed on the apparatus.

- 50,000 psi minimum yield strength steel plate cross members



- Manufacturer's lifetime warranty to match frame warranty. No Exceptions.
- Installed with one-piece cross member gusset to maximize vertical strength and minimize cross member flex
- Crossmembers can be inverted when required to allow for PTO drive line installation without the need for notching or modifying the cross members in anyway. No Exceptions.

FRONT FRAME EXTENSION

A single piece 80,000 PSI steel extension shall be installed on the front of the frame rails.

- Reduces frame flex which translates into improved vehicle handling and ride quality
- Designs using multiple piece, bolted together extensions will not be acceptable since they are prone to more flexing, possible frame failure and cab cracking
- Allows radiator to be removed through the bottom of the frame extension without tilting the chassis cab
- Minimizes damage to the chassis cab in the event of frontal impact accident
- Maintains structural integrity of the chassis frame rails while attaching bumper extensions of varying lengths
- Splayed or notched frame rails and/or extensions shall not be accepted
- Provides foundational strength and stability of the cab tilt system which provides superior access to engine and cooling components

FRAME FINISH

The frame shall be powder coated to resist weather, dirt and other corrosive material.

Engine Placement

ENGINE

A Cummins ISX 12.0 liter diesel fueled, turbo charged engine shall feature the following:

- One of the highest power to weight ratios in its class



- Heavy-duty replaceable wet liners, roller followers, by-pass oil filtration with replaceable spin on cartridge and targeted piston cooling for longer service in tough work environments
- Improved cooled EGR system
- 729 cubic inches of displacement
- High pressure common rail fuel system producing a precise quantity of fuel at ultra high pressures
- Fully integrated, robust electronic engine controls
- Electric fuel lift pump. No Exceptions.

The engine shall be coupled with a Holset VGT™ (Variable Geometry Turbocharger).

The engine shall be filled with Citgo brand Citgard 500 (or equivalent) SAE 15W40 CJ4 low ash engine oil for proper engine lubrication.

The engine shall be EPA certified to meet the 2013 emissions standards without compromising performance, reliability or durability using cooled exhaust gas recirculation and selective catalytic reduction technology.

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

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

ENGINE PLACEMENT

The engine shall be a maximum of 36" from the center line of the front axle to the front face of the engine block. The engine valve cover shall be a maximum of 23" from the top of the frame.

The engine placement shall provide optimal weight distribution to the front axle to enhance vehicle handling. More weight out in front of the front axle can cause a "fulcrum effect" and cause unsafe "bump steer" conditions.

The engine shall be mounted in a position that provides for the lowest possible height of the interior engine tunnel. An engine tunnel height from the floor of the chassis cab shall be no more than 21" high inside the cab.



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 integrated in the air dryer assembly.

HORSEPOWER

The engine shall have 500 horsepower at 1800 RPM, with a governed speed of 2100 RPM.

The engine shall have 1645 foot pounds of torque at 1200 RPM.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, one (1) piece eleven (11) blade Horton clutched type fan drive, and shroud.

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.

The clutch fan shall automatically engage in pump mode (when applicable).

AUXILIARY ENGINE BRAKE

A Cummins engine compression brake, for the six (6) cylinder engine, shall be provided. The engine compression brake shall:

- Activate upon 0% accelerator when in operation mode and activate the vehicle's brake lights.



TRANSMISSION PRE-SELECT

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

AUXILIARY ENGINE BRAKE CONTROL

An auxiliary engine 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.

The auxiliary brake shall be controlled through an on/off switch and individual low/medium/high selector switches on the Driver's panel.

ENGINE PROGRAMMING HIGH IDLE SPEED

The Engine high idle will be set at 1250 RPM. The high idle will be operational only when the parking brake is set and the truck transmission is in neutral.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. The high idle shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output and optimize output of the HVAC system.

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 through an virtual switch in the Vista, or automatically re-engage when the brake is set, or when the transmission is placed in neutral. A light on the Vista screen shall indicate the high idle speed control.



ENGINE AIR INTAKE

The engine air intake system shall include an ember separator air intake filter which shall be located behind the fascia.

The 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 intake shall also feature a cyclone style water separator to remove unwanted moisture from incoming air.

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

The filter must have a capacity of no less than 1350 cubic feet of air per minute. The filter paper media must be of a flame retardant treated material. An electric air filter restriction indicator shall also be included with the system.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction catalyst (SCR) to meet current EPA standards.

The selective catalytic reduction catalyst shall utilize a diesel exhaust fluid solution consisting of urea and purified water to convert nitrogen oxide 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 0.065-inch-thick stainless steel exhaust tubing between the engine turbo and the DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall all be connected with zero leak gasketed clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires with an exhaust gas diffuser.

The diffuser shall lower exhaust gas temperatures during the regeneration cycle.



The DPF and SCR shall be mounted to the frame using brackets that shall be hot dipped galvanized there by creating a superior barrier from corrosion. Powder coated or painted brackets shall not be accepted. No exception.

DIESEL EXHAUST FLUID TANK

There shall be a molded cross linked polyethylene tank for the Diesel Exhaust Fluid (DEF). The tank shall have a capacity of not less than five (5) usable gallons (18.92 Liters) and shall be mounted on the left hand side of the chassis frame in front of 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.

DIESEL EXHAUST FLUID TANK

There shall be an access door provided in the top rear step of left side crew area for access to the DEF tank.

ENGINE EXHAUST ACCESSORY

The end of the exhaust system shall include a Nederman 45 degree collar for attaching to the exhaust extraction system.

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.

DIESEL PARTICULATE FILTER CONTROLS

Provide DPF system status annunciation indicator lights, lights shall be installed on driver dash to alert driver when regeneration is needed and when DPF is in an active re-generation cycle.

Warning systems shall provide DEF low level warning.



Driver's dash shall be provided with two (2) controls for the Diesel particulate filter; one (1) manual regeneration switch to activate a regeneration cycle manually when passive burn is unobtainable due to driving conditions; and one (1) Regen "Inhibit Switch".

The switches shall be located in a covered location.

ENGINE COOLING SYSTEM

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system requirements.

The system shall include and feature the following:

- A vertically stacked charge air cooler providing the maximum cooling capacity for the engine. Proposals offering horizontally stacked charge air cooler shall not be acceptable. No Exceptions
- The charge air cooler and radiator shall measure not less than 1382 square inches
- A surge tank with a low coolant probe and capable of removing entrained air from the cooling system, with built in sight glass
- Radiator re-circulation shields to prevent heated air from re-entering the cooling system and affecting performance
- Mounts allowing the entire radiator to drop through the frame for service when needed - No Exceptions
- Engine placement shall provide a minimum of 8" between the engine fan and radiator to maximize the airflow and cooling of the engine.
- A Spin on Element water filter with corrosion inhibitor shall be provided for the cooling system. No Exception.
- The coolant filter shall be provided with two (2) shut off valves, one (1) one inlet and one (1) outlet. No Exception.
- Cooling system shall be tested and certified by the engine manufacturer

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include constant tension spring clamps.



ENGINE COOLANT

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

Supplemental coolant additives (SCA) are not required as this is part of the extended life coolant makeup.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. This pump heat exchanger shall circulate water from the fire pump to the heat exchanger thereby reducing the temperature of the coolant for the engine. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant.

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing; one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.

The transmission shall include two (2) internal oil filters and Allison approved transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

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

The transmission gear ratios shall be:

1st	3.51:1
2nd	1.91:1
3rd	1.43:1
4th	1.00:1
5th	0.74:1
6th	0.64:1 (if applicable)
Rev	4.80:1



TRANSMISSION 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 magnetic oil drain plug.

AUTOMATIC NEUTRAL

The transmission shall be provided with an automatic neutral. When the parking brake is applied the transmission automatically returns to neutral.

TRANSMISSION FLUID

The transmission shall include two (2) internal oil filters and Allison approved 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.

TRANSMISSION SHIFT SELECTOR

An Allison GEN V pressure sensitive range selector touch pad shall be provided and located on the tunnel to the right of the driver.

The shift selector shall provide an indicator on the digital display and shall alert the driver/operator when a specific maintenance function is required.

PTO LOCATION

The transmission driven power take off (PTO) shall be mounted in the 1:00 o'clock position.

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.

TRANSMISSION PROGRAMMING

The EVS group package number 127 shall contain the 198 vocational package for the fire service for 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 which requires re-selecting the 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. The transmission will detect the pump engaged signal and automatically select or deselect fourth gear lock-up. 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 nine (9) pin diagnostic connector will be provided next to the steering column.

The trans module shall contain the following circuits:

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

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1810 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®.

FUEL SYSTEM

The fuel tank shall have a capacity of fifty (50) gallons/one hundred eighty-nine (189) liters and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length. The tank shall offer:

- A vent port which will facilitate venting to the top of the fill neck for rapid filling without any “blow-back”
- Two (2) 2” NPT fill ports for left and right hand fill with a .5” NPT drain plug centered side to side 9" from the front of the tank
- A roll over ball check vent for temperature related fuel expansion and draw



- A design including dual draw tubes and sender flanges
- A baffled design and shall be constructed of steel
- A black Powder Coated exterior to ensure corrosion resistance

The fuel tank shall be mounted below the frame, behind the rear axle. There shall be two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank, allowing the tank to be easily lowered and removed for service purposes.

The strap hanger material shall be stainless steel. No Exceptions.

For isolation of vibration and movement, rubber isolating pads shall be provided between the tank and the hanger strap assemblies. The tank straps shall be attached to rubber coated cross members which help isolate the tank from frame flex.

Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

All fuel lines shall be connected with steel fittings with all fittings pointed towards the right side (curbside) of the chassis.

The chassis fuel lines shall feature an additional 4’ of length provided so the tank can be easily lowered and removed for service purposes which shall be coiled and secured at the top of the tank.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Fleetguard FS1065 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 black aramid braided lines with a fiber outer braid. The fuel lines shall be connected with reusable steel fittings. Fuel line is compatible with bio-fuel blends.



FUEL SHUTOFF VALVE

Two (2) fuel shutoff valves shall be installed at the fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

FUEL COOLER

The cross flow air to fuel cooler shall be all aluminum and shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the battery box, under the frame.

The fuel cooler shall incorporate a fan for improved heat transfer.

The fuel cooler shall be mounted to the frame using hot dipped galvanized brackets. Powder coated or painted brackets shall not be acceptable. No exception.

ALTERNATOR

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

V-MUX ELECTRICAL SYSTEM

There shall be a 12-volt direct current single starting electrical system providing power to all components for the cab and chassis. The system shall feature:

- A Weldon Multiplexed system
- 300 degree Fahrenheit high temperature, flame retardant loom
- All SAE wiring color coded and labeled as to its function
- Wiring which is cross link with 311 degree Fahrenheit insulation
- A suppressed system in accordance with SAE J551

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional



electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload.

General protection circuit breakers will be a combination of automatic and manual reset breakers. This will provide a durability and capacity maximization of the electrical system. When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

EMI/RFI PROTECTION

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

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

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

ELECTRICAL HARNESSING INSTALLATION

To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will



conform to the following specifications:

SAE J1128 - Low tension primary cable

SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

SAE J163 - Low tension wiring and cable terminals and splice clips

SAE J2202 - Heavy duty wiring systems for on-highway trucks

NFPA 1901 - Standard for automotive fire apparatus

FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A

For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.

Wiring will be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wiring will be color, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors will be protected by an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

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

- All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed.
- All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
- Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.



- For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.
- Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas will have protective Coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.
- Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.
- All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.
- All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer will conform to the following requirements:

SAE J1127 - Battery Cable

SAE J561 - Electrical terminals, eyelets and spade type

SAE J562 - Nonmetallic loom

SAE J836A - Automotive metallurgical joining

SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring

NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing will be installed utilizing the following guidelines:



- All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number.
- Splices will not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color.
- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery.

SUMMARY OF LOAD MANAGEMENT SYSTEM

In the V-MUX electrical system there will be eight pre-defined Load Manager Trigger points spaced apart in 0.4 Volt increments. Each Output channel can be set for Load Management that will be turned OFF if node voltage falls below a certain level. The trigger points will be configured as shown below.

Load Manager Trigger Points:

1: 12.5-V	Load Shed Region 1 (12.5 - 12.1 V)
2: 12.1-V	Load Shed Region 2 (12.1 - 11.7 V)
3: 11.7-V	Load Shed Region 3 (11.7 - 11.3 V)
4: 11.3-V	Load Shed Region 4 (11.3 - 10.9 V)
5: 10.9-V	Load Shed Region 5 (10.9 - 10.5 V)
6: 10.5-V	Load Shed Region 6 (10.5 - 10.1 V)
7: 10.1-V	Load Shed Region 7 (10.1 - 9.7 V)
8: 9.7-V	

When the voltage of a Load Managed device recovers back above the trigger point, there will be an



additional 30 seconds before the Output channel is turned back ON. This buffering time is to ensure that the added load doesn't immediately pull the voltage back below the trigger point.

Below are the standard voltage managed outputs that will be triggered off at 12.1 V.

HVAC FAN MED
HVAC FAN HIGH
HVAC FAN LOW
AUX DEFROST FANS
A/C CONDENSER FANS RLY
A/C COMPRESSOR CLUTCH

AUTO THROTTLE (AUTO HIGH IDLE)

There will be an Automatic High Idle (Auto Throttle) logic that will run in conjunction with the Load Management. The Auto Throttle logic will be run on the Hercules node under the passenger side kick panel compartment. The standard system design will be triggered on at 12.3 V and triggered off at 12.6 V with a 30 second delay before disengagement. The Auto Throttle function will act to turn the V-MUX High Idle Output ON and OFF. In turn the High Idle sends a signal to the engine ECU. The Auto Throttle Command will be interlocked with **Park Brake** and **Park/Neutral** for safety. A **Service Brake** override interlock will also be configured to immediately return the engine to Low Idle if the vehicle has to move.

MULTIPLEX DISPLAYS

Two (2) Weldon Vista IV displays shall be located one (1) on the driver's side dash and one (1) on the officer's side of the dash.

The Vista IV displays shall feature:

- A full color LCD display screens
- A message bar displaying the time of day, and important messages requiring acknowledgement by the user
- Four (4) push button style controls on either side of the screen for the on-board diagnostics
- Seven (7) push button style controls located below the screen for the on-board diagnostics
- Video ready display screens for back- up cameras, thermal cameras, and DVD



- A DIN type input connector ready for GPS interfacing shall be incorporated into the back of the display
- There shall be a display which indicates any open cab door with a visual display.
- There shall be a text message indication for low washer fluid.

The Vista IV displays shall measure approximately 10.36” wide x 7.63” in height. Each shall offer varying fonts and background colors, shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

DRIVER SWITCHES

The driver switch panel to the right of the Driver's position shall include one (1) row with six (6) backlit rocker switches with laser etched labels located under the Weldon Vista screen.

Standard switches shall include:

- Windshield Wiper/Washer Control (except when Smart Wheel is specified)
- Dash panel dimmer switch

V-MUX WARRANTY – 4 YEAR

A four (4) year limited (V-MUX) multiplex system warranty, of Weldon Technologies, Incorporated; shall be provided by the apparatus manufacturer for parts and labor, while under normal use and service; against mechanical, electrical and physical defects from the date of manufacture.

The warranty shall exclude; sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one a (1) year repair parts and labor from the date of installation. A copy of the warranty shall be provided with each Bidders proposal for the review and evaluation of the Purchaser.

AM/FM/CD RADIO WITH WEATHERBAND

A radio receiver shall be located in the headliner. The receiver shall handle vibrations, temperature fluctuations, and humidity with ease. The front panel's protective covering shall keep out any dust and debris.

The receiver's AM and FM tuner shall feature presets for radio stations, and the Weather Band tuner shall include automatic NOAA weather for alerts to any severe weather and a compact disc player. A portable player jack shall be available on the front panel.



The backlit LCD display shall feature easy to read digital readout in all lighting conditions.

Overhead mount Driver's side.

SPEAKERS

Four (4) overhead speakers shall be provided in the cab for the radio.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder system installed. The system shall be designed to meet NFPA 1901. 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
- Service Brake
- Engine Hours
- 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. The laptop connection shall be a panel mounted female type A or B USB connection point, remotely mounted in the left side foot well of the cab. The latest software shall be available for download from the Weldon website.

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 activate an indicator light in the instrument panel, a digital seat position indicator with a seat position legend in the switch 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.

CAB INSTRUMENTATION

The instrumentation panel within the cab shall feature a Pacific Insight gauge panel which shall include three (3) 5" diameter information centers, telltale indicator lamps, control switches, alarms, and a LCD diagnostic panel.

The gauges shall be easy to read including red backlighting.

The instrument panel shall contain the following gauges and indicators:

The middle information center shall include:

- A programmable speedometer to read either 0 to 140 MPH or 0 to 140 KM/H
- An amber telltale lamp indicating the Check Engine
- An amber telltale lamp indicating MIL Engine Emissions System Malfunction
- A red telltale lamp indicating Stop Engine
- A tachometer gauge with 0-3,000 RPM

The right hand side information center shall include:

- A gauge to display the engine oil pressure with high and low level indicators and stop engine alarm
- A fuel level gauge with a low fuel indicator and alarm
- An LED bar displaying 4 stages of the level for the Diesel Exhaust Fluid (DEF) with a refill indicator
- A voltage gauge with low voltage indicator
- A water temperature gauge with high water temp indicator and alarm

The left hand side information center shall include:

- A primary air PSI gauge including low air and high air warning displays
- A secondary air PSI gauge with low and high air warning indication

An LCD diagnostic display, located in the left hand side information center shall include digital readouts for the following:

- Odometer
- Transmission oil temp
- Engine oil temp
- Speedometer



-
- Engine hours
 - Engine and transmission code
 - Exhaust temp
 - Engine coolant temp
 - Engine oil PSI
 - Turbo boost PSI
 - Primary air pressure
 - Secondary air pressure
 - Engine load %
 - Engine torque
 - Battery volts
 - Fuel level %
 - Vehicle speed
 - RPM
 - DEF level
 - Instant fuel economy
 - Average fuel economy
 - Engine hours
 - Capable to record three trips, each shall be include:
 - Trip distance
 - Fuel economy
 - Fuel used
 - Idle fuel used
 - The LCD screen shall also provide diagnostic capability

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located below the middle information center. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols. The following indicator lamps shall be located on the Telltale panel:

BLUE Indicator Lights



- High Beam Headlight

GREEN Indicator Lights

- Right Turn Indicator
- Left Turn Indicator
- Battery On (Always On)

YELLOW Indicator Lights

- Particle Filter Regeneration (DPF)
- Regeneration Inhibit (Switch Engaged)
- Air Intake Restriction
- High Exhaust System Temperature (HEST)
- Wait to Start (when applicable)
- ATC (Automatic Traction Control) (when applicable)
- Water in Fuel

RED Indicator Lights

- Low Engine Coolant Level
- Air Bag Warning (when applicable)
- Check Transmission
- High Transmission Temperature
- ABS
- Parking Brake

ALARMS

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

Alarm silence: Any active audible alarm will be able to be silenced with a button on the right side of the LCD screen.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.



DIAGNOSTIC PANEL

A diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved trouble shooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The following diagnostic panel shall include:

- Engine diagnostic port
- V-Mux USB diagnostic port (when applicable)
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- Diesel particulate filter regeneration switch (when applicable)
- Diesel particulate filter regeneration inhibit switch (when applicable)

It shall be accessible while standing on the ground and located inside the driver's side door, left of the steering column:

The following diagnostic panel shall include:

- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (when applicable)

It shall be located under the center dash by the in dash HVAC unit and accessible through the access cover:

BACKLIGHTING COLOR

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

BATTERIES

The single start electrical system shall include six (6) group 31 1070 CCA batteries.

The batteries shall feature:

- A 210-minute reserve capacity
- 4/0 dual path starter cables per SAE J541
- Heat shrink and sealant encapsulated ends on the cables
- Maintenance free



BATTERY COMPARTMENTS

A well ventilated battery storage compartment shall house the batteries on the officer and driver side of the chassis and shall be located so as to offer easy access to the batteries when the cab is tilted.

Each battery compartment shall feature:

- 3/16" steel construction with powder coated finish
- A complete floor of heavy duty, industrial grade, recycled Turtle Tile brand interlocking matting
- A double hinged powder coated steel cover with two (2) rubber latches shall be utilized providing easy access to the batteries. No tools shall be required to gain access to the batteries.
- When in the open position, the double hinged door shall be flush with the bottom of the battery compartment, allowing for a sweep out style floor and removal of the batteries when necessary, without the inference of a lower lip. No Exceptions.

BATTERY CABLES

The starting system shall include cables which shall be protected by a 275-degree F, minimum high temperature flame retardant loom.

The cables shall be in a loom to help keep out dirt, dust and debris.

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.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a marine grade two position switch, of which shall be mounted on the left side of the steering wheel adjacent to the driver's knee.

A push button type starter button shall be provided on the driver dash to the left of the steering wheel.

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



POWER & GROUND STUD

An electrical distribution panel shall include two (2) power studs. The studs shall be a minimum of 1/4" 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) 1/4" ground stud.

GROUND LIGHTS

Each door shall include a Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the cab step below each door.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

GROUND LIGHT ACTIVATION

The ground lights shall activate when the park brake is engaged.

CAB STEP LIGHTING

One (1) LED light shall be mounted to the riser of the middle cab step, a total of eight (8) step lights for the cab, in accordance with NFPA.

Each light shall include a polycarbonate lens and shall be contained in a housing which is vibration welded with a bulb which shall be shock mounted. Each step light shall not be any larger than 3" in diameter.

STEP LIGHT ACTIVATION

The step lighting shall be activated by opening any of the cab doors on the respective side.

ENGINE COMPARTMENT LIGHTING

Four (4) LED lights shall be mounted to the engine compartment in such a fashion as to provide as much light as possible to the engine compartment area. The engine compartment lighting shall activate with the tilting of the cab.

INTERIOR OVERHEAD CAB LED LIGHTING

Each cab door shall include a dual red and white LED lamp. There shall be one (1) light centered over each of the Driver and Officer's seat and one centered over each crew door.



The clear lamp shall illuminate with the opening of each respective door with both the red and clear portions of the lamp activated by individual lighted switches on each lamp.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red Whelen round LED light with a red lens clearly labeled "Do Not Move Apparatus".

The flashing red light shall be 3.00 inches in diameter and shall be located centered left to right for greatest visibility.

The light 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.

DOOR OPEN ALARM

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

BACK-UP ALARM

{Quantity} Preco self-adjusting automatic electric back-up alarm shall be wired to the back-up light circuit, and mounted under the rear of the apparatus body.

REAR & SIDE FACING CAMERA

A rear facing box style rearview camera shall be installed on the rear of the vehicle. There shall also be two (2) teardrop style rearview cameras; one mounted to the Officer side of the vehicle, and one to the Driver side of the vehicle. The rear camera shall be activated when the vehicle transmission is shifted to reverse, and the side tear drop cameras shall be activated with the corresponding blinker. The image viewed on the Driver and Officer's Vista.

BATTERY CHARGER

KusmaulCharger	091-216-40/20
Display	091-194-IND-WT-XX
Auto Pump	091-9HP
Super Auto Eject	091-55-20-120-YW

KusmaulCharger	091-216-40/20
Display	091-194-IND-WT-XX



Auto Pump	091-9HP
Super Auto Eject	091-55-20-120-YW

SHORELINE LOCATION

The shoreline shall be located in the driver's side behind the front door above the wheel well.

The Battery Charger indicator shall be located in the canopy window.



APPARATUS WARNING PROVISIONS SPECIFICATIONS

ELECTRIC SIREN AND CONTROL

One (1) 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.

Mount the microphone as shown on the fire department supplied center console layout.

SPEAKER

One (1) Federal Signal DynaMax Model #ES100 100-watt speaker shall be installed. The black aluminum speaker shall include a polished trim #ESFMT.

A Federal Signal #ESFMT recess mount, stainless steel polished trim ring shall be used to flush mount each speaker.

SPEAKER

One (1) stainless steel grille shall be installed on the speaker.

SPEAKER LOCATION

The siren speaker shall be installed on the apparatus bumper extension, as determined by the body manufacturer.

SIREN CONTROL

One (1) electronic switch shall be provided integrally with the apparatus' horn to activate the siren.

FEDERAL MECHANICAL SIREN

One (1) Federal Signal Q2B mechanical siren shall be recess mounted into the left side of the front bumper. The "Q" siren shall feature a highly polished chrome body and grille. The siren's distinctive mechanical wail sound shall produce 123 db at 10'. The siren control switch(es) shall be installed in the cab.



SIREN CONTROL

One (1) foot switch shall be provided on the driver's side of the cab floor to activate the Federal Signal Q2B siren.

The foot switch shall be mounted on a 15 Degree angled flange. The same flange shall incorporate the air horn foot switch.

Q SIREN CONTROL

A red dual action momentary rocker switch shall be installed into the cab console to activate the Federal Signal Q2B siren. Pushing the switch up shall activate the Q siren, and pushing the switch down shall activate the brake function.

The specified switch shall be on the officer's side.

LIGHTBAR

One (1) Whelen Ultra Freedom IV light bar shall be included with the apparatus cab. The light bar shall be a model F4N7QLED and shall be mounted on the roof of the cab, towards the front, above the windshield.

The light bar shall feature:

- A 72" light bar designed for high performance
- Two (2) red Linear Super LED corner modules
- Two (2) red 400 series Linear Super LED endcap lights
- Two (2) red 400 series Linear Super LED forward facing lights, inboard of the white lights.
- Two (2) white 400 series Linear Super LED forward facing lights with clear optic lenses outboard of the afore mentioned red lights. These shall be responding lights, not take-down lights.
- Clear hard coated lenses to provide extended life/luster protection against UV & chemical stresses
- Designed in accordance with NFPA Zone A requirements

All of the lens shall be clear.

The white forward facing lights shall be responding lights, not take down lights.

The two center positions shall be red. Next to the two red center lights shall be the white lights.



TRAFFIC LIGHT CONTROL

One (1) Global Traffic Technologies Opticom 795H Low-Profile LED high-priority traffic light emitter and control device shall be installed and mounted in the specified lightbar. The traffic emitter shall be wired thru the park brake to deactivate when the park brake is set.

LIGHTBAR ACTIVATION

The front upper light bar activation shall be through a virtual switch on the Weldon Vista screen.

UPPER REAR WARNING LIGHTS

One (1) pair of Whelen model M9 LED warning lights shall be installed, one each side on the upper rear of the apparatus body. The dimensions of the lights shall be 6-1/2" x 10-3/8".

The driver side warning light shall be a Whelen Model M9RC red Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M9RC red Super-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M9FC chrome flange.

UPPER SIDE REAR WARNING LIGHTS

One (1) pair of Whelen model M9 LED warning lights shall be installed, one each side on the upper portion of the body side, towards the rear of the body. The dimensions of the lights shall be 6-1/2" x 10-3/8".

The driver side warning light shall be a Whelen Model M9RC red Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M9RC red Super-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M9FC chrome flange.

UPPER WING FRONT WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side one the front of the chassis cab upper grille area. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.



The officer side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

INBOARD WARNING LIGHTS

One (1) pair of Whelen model 6RB Rota-Beam LED warning lights shall be installed, one each side, on the front of the chassis cab, in the inboard warning light position. The dimensions of the lights shall be 4-3/16" x 6-9/16".

The driver side warning light shall be a Whelen Model 6RBRC red-LED with clear lens.

The officer side warning light shall be a Whelen Model 6RBRC red-LED with clear lens.

INTERSECTION WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed one each side of the chassis cab. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The lights shall be mounted on the bumper tails, one (1) each side on the flat surface.

The driver side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

LOWER MID CHASSIS WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed one each side of the chassis cab, above the chassis wheels. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.



LOWER REAR SIDE WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side of the apparatus body, towards the rear of the body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The lights shall be mounted below the SCBA and Fuel doors, one each side.

The driver side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

LOWER REAR WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side on the lower rear of the apparatus body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6RC red Super-LED™ with clear lens.



APPARATUS 12 VOLT ELECTRICAL SPECIFICATIONS

LOW VOLTAGE ELECTRICAL SYSTEM SPECIFICATIONS

The following specifications describe the low voltage electrical system on the specified rescue fire apparatus. The electrical system shall include all panels, electrical components, switches and relays, wiring harnesses and other electrical components. The electrical equipment installed by the apparatus manufacturer shall conform to current automotive electrical system standards, the latest Federal DOT standards, and the requirements of the applicable NFPA 1901 standards.

The apparatus shall have a Weldon V-MUX multiplexing system, to provide diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The electrical system shall be pre-wired for computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics, troubleshooting, or program additions. There shall be a diagnostic display provided in the cab. The multiplexed system shall use twisted-pair shielded wire within the electrical system for noise reduction. The diagnostic display shall allow for fault and condition messages to be displayed. For superior system integrity, the networked system shall meet the following minimum requirement components:

- Power management center
- Load shedding power management
- Solid-state circuitry
- Switch input capability
- Responsible for lighting device activation
- Self-contained diagnostic indicators
- Power distribution module
- Diagnostic display for warning message indication
- High Idle Function

All wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the protected circuit. Voltage drops in all wiring from the power source to the device shall not exceed 10 percent. The wiring, wiring harness and insulation shall be in conformance to applicable SAE J-1128 with GXL temperature properties and NFPA standards. All exposed wiring shall be protected in a loom with a minimum temperature rating of 289 degrees Fahrenheit. All wiring looms shall be properly supported and attached to body members. The electrical conductors shall be constructed in accordance with applicable SAE standards, except when good engineering practice requires special construction.



The wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection and shall be installed in accordance with the device manufacturer's instructions. Electrical connections shall be with mechanical type fasteners and large rubber grommets where wiring passes through metal panels.

The wiring between the cab and body shall be joined using Deutsche type connectors or in an enclosed terminal junction panel. This system will permit body removal with minimal impact on the apparatus electrical system. All connections shall be crimp-type with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system.

Any electrical junction or terminal boxes shall be weather resistant and located away from direct water spray. In addition, the main body junction panel shall house the automatically reset breakers and relays as required.

There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless they are enclosed in an electrical junction box or covered with a removable electrical panel. The wiring shall be secured in place and protected against heat, liquid contaminants and damage. Wiring shall be uniquely identified at least every two feet (2') by color coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of the applicable NFPA 1901 standards.

The electrical circuits shall be provided with low voltage over current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather resistant enclosures. The over current protection shall be suitable for electrical equipment and shall be the automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of the maximum current for which the protected circuit. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

The electrical system shall include the following:

1. Electrical terminals in weather exposed areas shall have a non-conductive grease or spray applied. A corrosion preventative compound shall be applicable to all terminal plugs located outside of the cab or body.
2. The electrical wiring shall be harnessed or be placed in a protective loom.
3. Holes made in the roof shall be caulked with silicone. Large fender washers shall be used when fastening equipment to the underside of the cab roof.
4. Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate.



5. A coil of wire must be provided behind each electrical appliance to allow them to be pulled away from the mounting area for inspection and service work.
6. All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.

The warning lights shall be switched in the chassis cab with labeled switches in an accessible location. Individual rocker switches shall be provided only for warning lights added over the minimum requirement level of warning lights in either the stationary or moving modes. All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the operator. Rocker type warning light switches shall be utilized. For ease of nighttime operation, an integral indicator light shall be provided to indicate when the circuit is energized. All switches shall be appropriately identified as to their function.

A single warning light switch shall activate all required warning lights. This switch will allow the vehicle to respond to an emergency and "call for the right of way". When the parking brake is applied, a "blocking right of way" system shall be automatically activated per requirements of the NFPA 1901 standard. All "clear" warning lights shall be automatically turned off upon application of the parking brake.

NFPA REQUIRED TESTING OF ELECTRICAL SYSTEM

The apparatus shall be electrically tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with the delivery documentation per requirements of the NFPA 1901 standard. The following minimum testing shall be completed by the apparatus manufacturer:

1. Reserve capacity test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a failed test.

2. Alternator performance test at idle:

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



3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, if an alarm sounds due to excessive battery discharge, as detected by the system requirements in the NFPA 1901 standard, or a system voltage of less than 11.7 volts dc for a 12 volt system is present for more than 120 seconds, the test shall be considered a failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts dc for a 12 volt system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA REQUIRED DOCUMENTATION

The following documentation shall be provided on delivery of the apparatus:

- a. Documentation of the electrical system performance tests required above.
- b. A written load analysis, including:
 1. The nameplate rating of the alternator.
 2. The alternator rating under the conditions.
 3. Each specified component load.
 4. Individual intermittent loads.

DOOR OPEN SYSTEM ON VISTA SCREEN

The cab and body main compartment doors shall be wired to illuminate an open door indicator on the Weldon V-MUX Vista screen located in the cab when the parking brake is released. The indicator shall individually specify the door(s) that is(are) open.

As well as the cab doors, the screen shall indicate which compartment door is open and any other equipment that may be in the open or up position such as the monitor.



AIR HORNS

One (1) Grover brand Stutter Tone air horn shall be mounted to the bumper. The air horn shall be 6" in diameter and 24" long. The horn shall feature a flared end offering a pleasing appearance.

AIR HORN LOCATION

The air horn shall be located on the driver's side of the bumper.

AIR HORN FOOT SWITCH

One (1) foot switch shall be installed to activate the air horn system on the driver's side of the floor.

The foot switch shall be mounted on the same flange as the Q2B foot switch.

AIR HORN SWITCH

One (1) switch shall be installed to activate the air horn system on the officer's side of the cab dash.

Black, rubber covered push-button switch.

12 VOLT POWER SOURCE

Two (2) 12-volt power and ground connection rated at 20 amps shall be provided in front of the chassis cab.

The 12V power and ground will need to be supplied to the customer supplied computer mounted on top of officer's side EMS compartment.

There also shall be one fused multi-output panel installed on the front lower face of the officer's side EMS compartment.

The power source shall be "constant hot" and remain active regardless of the position of the master battery switch.

12 VOLT POWER SOURCE

Two (2) 12-volt power and ground connection rated at 20 amps shall be provided in an exterior compartment of the apparatus body.

The locations of the power and ground connections shall be in the R3 compartment, on the forward facing wall, above the full depth shelf.

The power source shall be "constant hot" and remain active regardless of the position of the master battery switch.



12 VOLT POWER SOURCE

Two (2) 12-volt cigarette lighter style power connections rated at 15 amps shall be provided at the rear of the engine dog house. The power points shall be recessed and rear facing between the two drawers in the module behind the center Havis console.

--The location for the 12v power points are to be between the rear facing shelves that are incorporated into the custom customer designed dog house drawer system. See drawing of center console layout provided by Fire Department in production file.

The power source shall be run through the chassis master battery switch and shall be deactivated when the master switch is in the "OFF" position.

PUMP ENCLOSURE LIGHTS

One (1) LED work light shall be provided in the pump enclosure.

The control switch shall be mounted on the light head.

LIGHT MOUNTING LOCATION

The mounting location for the specified light shall be on the front edge of the chassis cab roof.

SCENE LIGHT

One (1) Fire Research Evolution II LED model FCA808-V20-03 contour roof mount light shall be installed. The mounting brackets shall attach to the bottom of the lamphead and be machined to conform to the roof radius. Wiring shall extend from a weatherproof strain relief at the rear of the lamphead.

The lamphead shall have eight (8) ultra-bright white LEDs. It shall operate at 12/24 volts DC, draw 13/6.5 amps, and generate 20,000 lumens. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamphead shall incorporate heat-dissipating fins and be no more than 4" high by 11 1/2" wide. The lamphead and mounting arm shall be powder coated white. The floodlight shall be for fire service use.

SCENE LIGHT SWITCHING

The one (1) front scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screens.

ROOF TOP SPOT LIGHT

Two (2) GoLight Model 20204 (white) LED spotlight with wired dash-mount remote shall be installed on the cab roof.



The lights shall be located on each side of the light bar and mounted to the cab roof, not the light bar.

Controls for the lights shall be center dash mounted for control by both the driver and officer.

PORTABLE LANTERN

Two (2) Pelican 9415 LED yellow portable handlights shall be installed. The lanterns shall include a 6061 direct wiring kit, a mounting bracket and 12 volt chargers.

PORTABLE LANTERN

One (1) Streamlight “Vulcan” LED portable handlight shall be installed. The lantern shall include a mounting bracket, with 12 volt charger wired to the battery system to allow the light to recharge when not in use.

HANDLIGHT INSTALLATION

The location of the handlight installation shall be in the apparatus body. All components shall be installed as directed by the fire department.

The lantern shall be installed in the L1 Compartment

INTERCOM SYSTEM

The vehicle shall be equipped with a Sigtronics US45D intercom master station. The system comes standard with connections for up to four (4) positions plus one (1) pump panel position. Two positions plus the pump panel position will have radio transmit capability.

This system can operate with two (2) mobile radio. Connection of this system to the mobile radio is not included, unless specified.

Delete the pump panel position. Not required by the FD.

This system can operate with two (2) mobile radios. Connection of this system to the mobile radio is not included, unless specified.

INTERCOM HEADSET

Four (4) SE-8 Under-The-Helmet-Headset shall be provided with the intercom system. The mic is always live for intercom communication. Appropriate for all positions.

RADIO TO INTERCOM INTERFACE CABLES

Interface cables shall be provided connecting the specified Sigtronics US-45D intercom system to a Harris 800 MHz Mobile Radio and a Midland VHF Mobile Radio.



RADIO ANTENNA

Two (2) radio antenna shall be supplied by the customer and installed on the apparatus. The location shall be determined by the customer.

Antennas will be for an 800 MHz radio, a VHF radio and a 5 in 1 GPS & data antenna mounted as shown on drawing sent in with production files.

Exact locations for running the cables shall be determined during the mid-construction conference.

RADIO SPEAKER

Two (2) fire radio speaker shall be supplied by the customer and installed on the apparatus. The location shall be determined by the customer.

Mount speakers on centered on overhead panel.

RADIO

Two (2) fire radio shall be supplied by the customer and installed on the apparatus. The location shall be determined by the customer.

12 VOLT POWER SOURCE

Two (2) 12-volt power and ground connection rated at 30 amps shall be provided on the apparatus for the installation of a mobile two-way radio.

The power source shall be run through the chassis master battery switch and shall be deactivated when the master switch is in the "OFF" position.

RADIO SPEAKER

Two (2) fire radio speaker shall be supplied by the customer and installed on the apparatus. The location shall be determined by the customer.

NEDERMAN TRANSMITTER

One (1) transmitter shall be installed by the fire department the 15 amp circuit shall be wired by Rosenbauer.

The Nederman transmitter will not be supplied, please provide 15a switched power to the area behind the dash coiled up and labeled



KNOX BOX

One (1) Sentralock master key box shall be supplied by the customer and installed. The location shall be determined by the customer.

The Knox box shall be mounted next to the cup holders in the Zone 8 position. The blank plate shall be modified to hold the Knox box and provide a 4" x 4" single cup holder next to the box.

Please see FD supplied center console layout for more information.

CUSTOMER SUPPLIED 911 COMPUTER SYSTEM

Mounting plate for the data 911 monitor. The monitor will be mounted to the top of the officers side dash mounted flush to the top of the dash and at the same angle of the dash.

Clarify: the computer for the 911 data monitor is to be mounted on top of the officers side EMS cabinet.

Mounting tray for the 911 Data key board. Mounted on the officers side of the next to the Havis on top of the dog house.

The USB cable from the key board will need to be extended from the computer to the key board.

The display will be mounted to a 3/16 mounting plate and will cover the chassis supplied glove box. The screen will be mounted to the face of the glove box and the top of the monitor will be flush to the top of the dash. The computer brain is to be mounted to the removable mounting system on top of the officers EMS cabinet called out in the spec.

MARKER LIGHTS

LED marker lights shall be installed on the vehicle in conformance to the Department of Transportation requirements.

LICENSE PLATE BRACKET

One (1) Cast Products license plate bracket shall be provided at the rear bumper. The bracket shall have a polished finish and LED light.

TAIL LIGHTS

One (1) pair of Whelen M6 LED tail/brake lights shall be provided. The rectangular 4"x6" lights shall be red.



TURN SIGNALS

One (1) pair of Whelen M6 LED turn signals with populated sequential chevron arrow shall be provided.

BACKUP LIGHTS

One (1) pair of Whelen Series M6 LED backup lights shall be installed on the rear of the apparatus body. The dimensions shall be 4" x 6" and the lens color shall be clear.

FOUR LIGHT HOUSING

One (1) pair of chrome plated tail light housings shall be supplied. Each housing shall be designed to hold four (4) Whelen M6 rear lights located at the lower rear corners of the body.

MID BODY LED TURN SIGNALS

One (1) pair of mid body LED turn signals shall be provided. The location of the turn lights shall be at mid-body near the rear wheel axle.

GROUND LIGHTS

There shall be two (2), one each side, Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rub rail of the pump house.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

The ground lighting shall be activated when the parking brake is set.

GROUND LIGHTS

There shall be two (2), one each side, Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rub rail, mid body.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

The ground lighting shall be activated when the parking brake is set.



GROUND LIGHTS

There shall be two (2) Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rear step.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

The ground lighting shall be activated when the parking brake is set.

The ground lights shall automatically activate when the parking brake is applied.

REAR TAILBOARD LIGHTS

Two (2) LED step lights with clear lens shall be installed to illuminate the step surfaces at the rear of the apparatus body.

The step/walkway light switch shall be installed and wired to the parking brake.

SCENE LIGHT

Four (4) Whelen M9 Series Super-LED 7-1/8" x 9-1/8" gradient scene light(s) with chrome plated surface mount flange shall be installed.

SCENE LIGHT LOCATION

One (1) scene light shall be located on the left side of the cab.

SCENE LIGHT LOCATION

One (1) scene light shall be located on the right side of the cab.

SCENE LIGHT LOCATION

Two (2) scene light shall be located on the rear of the apparatus body.

The lights shall be mounted below the rear red warning lights, one each side.

SCENE LIGHT SWITCHING

One (1) scene light switch shall be wired through the driver's Vista screen to activate the left side scene lights upon engagement.



SCENE LIGHT SWITCHING

One (1) scene light switch shall be wired through the driver's Vista screen to activate the right side scene lights upon engagement.

SCENE LIGHT SWITCHING

The one (1) rear scene light(s) shall activate via a virtual scene light switch located on the driver's Vista screen.

SCENE LIGHT SWITCHING

One (1) rear scene light switch with indicator shall be installed on the driver's side rear body to control the rear scene light(s). The switch shall be labeled "REAR SCENE".

The rear switch shall be at the rear of the body on the driver's side above the taillight bezel. There shall be a single switch, please do not use the three place with blanks.

LED SURFACE MOUNT SCENE LIGHT

Two (2) Fire Research model SPA260-Q20 surface mount light shall be installed. The light shall be mounted with four (4) screws to a flat surface. It shall be 5-7/8" high by 14.5" wide and have a profile of less than 1 3/4" beyond the mounting surface. Wiring shall extend from a weatherproof strain relief at the rear of the light.

The lamphead shall have sixty (60) ultra-bright white LEDs, 56 for flood lighting and 4 to provide a spot light beam pattern. It shall operate at 12/24 volts DC, draw 13.8/6.9 amps, and generate 20,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead shall be powder coated. The LED scene light shall be for fire service use. The light housing shall be powdercoated with a chrome colored bezel.

SCENE LIGHT LOCATION

One (1) scene light shall be located on the left side of the apparatus body.

The scene light shall be installed on a treadplate mounting plate.

SCENE LIGHT LOCATION

One (1) scene light shall be located on the right side of the apparatus body.

The scene light shall be installed on a treadplate mounting plate.



SCENE LIGHT SWITCHING

The one (1) left side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screen and by a switch on the pump panel. The switching shall be wired to operate in a three-way configuration to allow the light(s) to be controlled from either location regardless of switch position. The switches shall be labeled "LEFT SCENE".

SCENE LIGHT SWITCHING

The one (1) right side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screen and by a switch on the pump panel. The switching shall be wired to operate in a three-way configuration to allow the light(s) to be controlled from either location regardless of switch position. The switches shall be labeled "RIGHT SCENE".

TRAFFIC ARROW LIGHT

One (1) Whelen Model #TAL65 Traffic Advisor shall be installed. The light shall be equipped with six (6) LED lights measuring 36" in length. The unit shall be mounted at the rear of the apparatus body. The Traffic Advisor control head shall be mounted inside the cab and be accessible by the driver and officer.

The traffic arrow light shall be surface mounted at the rear of the apparatus body.



APPARATUS CHASSIS MODIFICATIONS SPECIFICATIONS

FLUID DATA PLAQUE

One (1) fluid data plaque containing required information shall be provided based on the applicable components for this apparatus, compliant with NFPA Standards:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Drive axle lubricant
- Power steering fluid
- Pump transmission lubrication fluid
- Other NFPA applicable fluid levels or data as required

Location shall be in the driver's compartment or on driver's door.

DATA & WARNING LABELS

HEIGHT LENGTH & WEIGHT

A highly visible label indicating the overall height, length, and weight of the vehicle shall be installed in the cab dash area.

CAB SEATING POSITION LIMITS

The label shall also include the seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis.

NO RIDE LABEL

One (1) "NO RIDERS" label shall be applied on the vehicle at the rear step area or other applicable areas. The label shall warn personnel that riding in or on these areas, while the vehicle is in motion is prohibited.

TIRE PRESSURE PLAQUE

A label shall be placed in a visible area that indicates the front and rear tire pressure.



CAB SEATING POSITION LIMITS

One (1) label shall be installed in the cab to indicate seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis.

HELMET WARNING TAG

One (1) label shall be installed in the cab, visible from each seating position. The label shall read "CAUTION: DO NOT WEAR HELMET WHILE SEATED." Helmets must be properly stowed while the vehicle is in motion according to the current edition of NFPA 1901.

GREASE POINT MAP

An engraved plate showing all grease points on the chassis, pump, and any other device needing occasional greasing shall be provided and located in the cab of the chassis near the Fluids Plate.

An engraved plate showing all grease points on the chassis, pump, and any other device needing occasional greasing shall be provided and located in the cab of the chassis near the Fluids Plate.

REAR TOWING PROVISIONS

There shall be two tow eyes furnished under the rear of the body and attached directly to each chassis frame rail. There shall be a reinforcement spreader bar connecting the two tow eyes. Tow eyes are to be constructed of 3/4" plate steel with a 3" I.D. hole, large enough for passing through a tow chain end hook.

The tow plates shall be painted black.

BUMPER

The chassis shall feature a heavy duty bumper constructed from ASTM A36, 1/4" thick steel and painted primary job color. The bumper shall be 12" high by 102" wide with two inch (2") flanges and chamfered corners.

Integral heavy duty steel bumper "wings" shall extend from the bumper to the cab.

The bumper shall be mounted to an eighteen inch (18") long chassis frame extension.

A contoured apron / gravel shield fabricated from NFPA compliant, slip-resistant polished aluminum shall enclose the area between the bumper and the cab.

FRONT BUMPER COMPARTMENT

One (1) recessed fire hose compartment constructed from smooth aluminum shall be installed in the



center of the front bumper extension. Water drain holes shall be drilled in the bottom.

The size of the compartment shall be approximately 30.5"L x 11"W x 12"D.

BUMPER COMPARTMENT DOOR

One (1) aluminum tread plate door for the front bumper compartment shall be supplied. The flat door shall have a stainless steel hinge at the rear and a latch to secure the compartment.

The cover shall be notched allowing the hose to be preconnected to the hose connection.

A D-ring latch shall secure the cover in the closed position.

BUMPER COMPARTMENT DOOR SHOCK

A gas shock shall be supplied to hold the front bumper compartment door in the open position.

FRONT BUMPER COMPARTMENT

One (1) recessed fire hose compartment constructed from smooth aluminum shall be installed in the right side of the front bumper extension. Water drain holes shall be drilled in the bottom.

The compartment shall be as large as space permits.

BUMPER COMPARTMENT DOOR

One (1) aluminum tread plate door for the front bumper compartment shall be supplied. The flat door shall have a stainless steel hinge at the rear and a latch to secure the compartment.

BUMPER COMPARTMENT DOOR SHOCK

A gas shock shall be supplied to hold the front bumper compartment door in the open position.

COMPARTMENT MATTING

The bumper compartment floors shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking units, 12 x 12 square by 3/4" thick. This material shall be resistant to temperature, ultra-violet radiation, mechanical impacts, chemical actions and corrosion free.

TOW HOOKS

Two (2) tow hooks shall be mounted to the bumper extension under the bumper towards the rearward section of the extension. The tow hooks shall be steel and shall be painted black.



TOW EYES

Two (2) 3" tow eyes shall be mounted to bumper extension on the top of the bumper. The tow eyes shall be heavy polished nickel plated steel which shall not chip when used with chains and hooks.

TIRE PRESSURE INDICATOR

There shall be a tire pressure indicator at each tire's valve stem on the vehicle that shall indicate if there is insufficient pressure in the specific tire.

EXHAUST SYSTEM

The chassis exhaust shall be modified and redirected to the right side of the apparatus and will exit ahead of the rear wheel.

EXHAUST HEAT SHIELD

A heat shield shall be installed under the body in the areas where the exhaust system is routed.

REAR MUD FLAPS

One (1) pair of black mud flaps shall be installed behind the rear wheels.

ON-SPOT TIRE CHAINS

"On-Spot" automatic tire chains shall be installed on the rear axle of the apparatus. A switch installed on the cab dash shall allow the operator to "Engage" and "Disengage" the tire chains without stopping to enhance traction and braking while in forward or reverse motion. The system shall include protective switch guard, continuous duty solenoid, arm bearings and replaceable chainplates.

INTERIOR CABINET

There shall be one (1) forward facing cabinet installed on the rear wall of the cab. The cabinet shall be constructed of smooth aluminum plate and be approximately 10"H x 10"D x 74"L. The exterior of the compartment shall be painted with high performance polyurethane black paint to match the cabinets behind the driver's and officer's position. The interior of the compartment shall be left in the natural aluminum finish.

The compartment shall have three equally spaced individual sections. Three (3) horizontally hinged, smooth aluminum doors shall be installed on the cabinet. "Slam" style locking latches and pneumatic gas shocks shall be installed on each door.

LED strip lighting shall be provided across the top of each compartment section.



The exact design of the compartment shall match previous units.

The cabinet's exterior shall have an unpainted D/A orbital sander finish.

The cabinet's interior shall have a natural finish.

LATEX GLOVE BOX AND TWO (2) DRAWER MODULE

A module shall be provided and installed in the cab behind the Havis center console which shall include a latex glove box and two (2) drawer module.

Module to be based on design shown on the fire department supplied center console layout.

The engineering print for the design of this module shall be approved by the FD prior to manufacturing.

The cabinet's exterior finish shall match the interior finish of the chassis cab.

Please paint it black poly upol

The cabinet's interior shall have a natural finish.

MAP BOOK POCKETS - CAB DOORS

Four (4) map book pockets shall be located at the lower portions of the chassis cab doors. Please see PDF drawing for design and size.

Please see previous Sparks trucks.

Pockets will hold a 2" diameter 3 ring binder.

Mounting tray for the 911 Data key board. Mounted on the officers side of the next to the Havis on top of the dog house.

Mounting tray for the 911 Data key board. Mounted on the officers side next to the Havis on top of the dog house.

Radio/Computer EMS removable tray

The enclosure will be as large as possible in the area provided and will match the color of the EMS compartment. The rearward face is to be removable if needing quick access to the components installed. The console will be mounted to the top with 4 easily reached bolts so the mounting tray can be removed for service.

The enclosed computer/radio mount will be located on top of the officers EMS cabinet. It will be four sided and attached to the top of the EMS console with four easily accessible bolts so the entire module can be removed.

A 2 sided lip is to be added to the top of the drivers EMS compartment. It will bolt on and will have cargo style



webbing to secure items. It will be as tall as possible and will be painted to match ems compartment.

The cabinet's exterior finish shall match the interior finish of the chassis cab.

INTERIOR CABINET CARGO NETTING

One (1) full height, grid type nylon webbing up to 60" long, shall be provided and installed for the interior cabinet. The webbing shall be secured to the cabinet with quick release fastening devices.

Seatbelt style releases shall be provided.

The cargo netting shall be installed over the forward face of the crew seat riser.

CAB LIFT CONTROL LOCATION

The cab lift controls for tilting the cab shall be with a tethered removable cord. The connection for the cord shall be on the LHS pump panel. Proper operation and warning labels shall be installed adjacent to the controls.

AIR TANK DRAIN EXTENSION

Five (5) cable from the spring loaded air tank drain shall be routed and attached to the outer edge of the apparatus for ease of access. The 1/8" braided steel cable shall allow accumulated moisture in the air brake system to be easily drained. The cable shall be installed so that maximum ground clearance is maintained.



APPARATUS PUMP AND PLUMBING SPECIFICATIONS

HALE DSD SINGLE STAGE PUMP

A Hale model DSD, single stage pump shall be designed to mount in a pump module and shall be split-drive shaft driven. The pump shall be driven by a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.

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

PUMP BODY

The pump, the pump body and related parts shall be cast iron. All metal moving parts in contact with water shall be of high quality bronze or stainless steel.

IMPELLER

The pump shall have one impeller. The pump body shall have two opposed discharge outlet volute cutwaters to eliminate radial unbalance. Pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machined and individually balanced.

The vanes of the impeller intake eyes shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and shall be of wrap-around double labyrinth design for maximum efficiency.

PUMP SHAFT

Pump shaft shall be rigidly supported by bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel to be super-finished with galvanic corrosion protection for longer shaft life. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox.



PUMP TRANSMISSION

The pump transmission shall be of sufficient size to withstand 16,000 foot pounds of torque from the engine. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts shall be of heat-treated chrome nickel steel and be at least 2-3/4" in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine.

All gears both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life. An accurately cut spur design shall be provided to eliminate all possible end thrust.

PUMP MOUNTING

The pump shall be bolted to steel angles in the pump module, using grade 8 bolts.

DRIVELINES

Hollow-tube drivelines and universals shall be properly matched to the engine and transmission output torque ratings.

1500 GPM FIRE PUMP SPECIFICATIONS

The centrifugal type fire pump shall be a Hale model DSD midship mounted with a rated capacity of 1500 GPM. The pump shall meet NFPA 1901 requirements.

The pump shall be certified to meet the following deliveries:

- 1500 GPM @ 150 PSI
- 1500 GPM @ 165 PSI
- 1050 GPM @ 200 PSI
- 750 GPM @ 250 PSI

LEFT SIDE -- 6" UNGATED INTAKE

One (1) 6" un gated suction intake shall be installed on the left side pump panel to supply the fire pump from an external water supply. The threads shall be 6" NST. The intake shall be provided with a removable screen.

One (1) 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.



RIGHT SIDE -- 6" UNGATED INTAKE

One (1) 6" un gated suction intake shall be installed on the right side pump panel to supply the fire pump from an external water supply. The intake shall be provided with a removable screen.

OFFICER SIDE 6' LOW-PROFILE REMOTE CONTROL BALL INTAKE VALVE

There shall be a manual operated ball intake valve furnished on the officer side pump panel. One (1) Task Force Tips Model AX1ST-NX-RC, 6" ball type gated intake relief valve shall be provided. The valve shall be 6" LH female NST Swivel x 5" Storz fitting. The valve shall have a 30 degree swivel below the main body of the valve and swivel 360 degrees to allow hose to be connected in any position and prevent kinking. The valve shall be electrically controlled by a panel mounted switch module with LED lights to show valve position and a manual override knob. The valve shall be capable of either 12 or 24 volt operation and have a quick disconnect cable and pump panel mounted receptacle. The valve shall also be equipped with a 3/4" air bleeder valve and a pressure relief valve that is adjustable from 90-300 PSI. The valve shall meet slow-close requirements and not extend past the side of the apparatus as required by applicable.

One (1)A lightweight aluminum locking 5" Storz cap shall be provided. A chain or cable attachment shall be also supplied.

FIRE PUMP MECHANICAL WATER SEAL

The Hale fire pump shall have a high quality, self-adjusting, maintenance free mechanical seal.

ELECTRIC/PNEUMATIC PUMP SHIFT

The pump shift shall be an air operated and shall incorporate an air cylinder with an electric actuating switch to shift from road to pump and back. The power shift control valve shall be mounted in the cab. The fire pump-shift system shall be equipped with a means to prevent unintentional movement of the control device from its set position.

The system shall include a nameplate indicating the chassis transmission shift selector position to be used for pumping and located so that it can be easily read from the driver's position.

The system shall include applicable the NFPA interlocks, pump shift and OK TO PUMP indicator lights in the cab and pump panel. The fire pump system shall be equipped with an interlock system shall be provided to ensure that the pump drive system components are properly engaged in the pumping mode of operation so that the pumping system can be safely operated from the pump operator's position.

If applicable, the secondary braking device shall be automatically disengaged for pumping operations.



MANUAL OVERRIDE FIRE PUMP SHIFT

The Hale fire pump shall be equipped with a manual pull type shift on the pump panel location, with will be in addition to the air operated pump shift system.

FIRE PUMP ANODE

One (1) Hale Fire Pump Alloy Anode(s) shall be installed to reduce corrosion. The anode shall be a bolt-in or screw-in type and easily replaceable.

PRIMER

The priming pump shall be a Trident Emergency Products 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. A single panel mounted control will activate the priming pump and open the priming valve to the pump. The priming system shall have a five year warranty.

PRIMER CONTROL

A manual push button shall be provided on the pump operator's panel, for the manually priming the main pump.

PRESSURE GOVERNOR AND ENGINE-PUMP MONITORING

One (1) Fire Research InControl series TGA400 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The following continuous displays shall be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high
- Pressure / RPM setting; shown on a dot matrix message display
- Pressure and RPM operating mode LEDs
- Throttle ready LED
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display



- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display.

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature
- Out of Water (visual alarm only)
- No Engine Response (visual alarm only).

The program features shall be accessed via push buttons and a control knob located on the front of the control panel. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor, monitoring and master pressure display shall be programmed to interface with a specific engine.



PUMP ANODES

There shall be sacrificial, zinc anodes in the pump steamer ports which shall protect the pump and piping from electrolysis. These anodes shall also act as screens.

PUMP PLUMBING SYSTEM

The fire pump plumbing system shall be of rigid stainless steel pipe or flexible piping with stainless steel fittings. Mechanical grooved couplings shall be installed to permit flexing of the plumbing system and allow for quick removal of piping or valves for service. Flexible hose couplings shall be threaded stainless steel or mechanical grooved coupling connections.

The fire pump and plumbing shall be hydrostatically tested in compliance to applicable sections of NFPA standards. The test results shall be included in the delivery documentation.

FIRE PUMP MASTER DRAIN

The fire pump plumbing system and fire pump shall be piped to a single push-pull type master pump drain assembly.

ADDITIONAL LOW POINT DRAINS

The plumbing system shall be equipped with additional low point manually operated drain valves to allow total draining of the fire pump plumbing system. These valves shall be accessible from the side of the vehicle and labeled.

The drain valves shall not decrease the angle of approach of the chassis.

STAINLESS STEEL INTAKE MANIFOLD

The suction manifold assembly shall be fabricated with Schedule #10 type 304 stainless steel. All threaded fittings shall be a minimum of Schedule 10 stainless steel. The suction manifold assembly shall have radiused sweep elbows to minimize water turbulence into the suction volute. The suction manifold shall be welded and pressure tested prior to installation. The stainless steel manifold assembly shall be attached to the pump intake volute with a heavy-duty, flexible Victaulic coupling.

The stainless steel manifold assembly shall have a ten (10) year warranty.

STAINLESS STEEL DISCHARGE MANIFOLD

The discharge manifold assembly shall be fabricated with minimum of Schedule #10 Type 304 stainless steel. All threaded fittings shall be a minimum of Schedule #40 stainless steel. The discharge manifold assembly shall have radiused sweep elbows to minimize water turbulence. The manifold shall



be welded and pressure tested prior to installation. The stainless steel manifold inlet shall be attached to the pump discharge and have additional brackets as required to support the discharge manifold, valves and related components.

The stainless steel manifold assembly shall have a ten (10) year warranty.

FIRE PUMP & PLUMBING SYSTEM PAINTING

The fire pump and plumbing system shall be painted by the fire apparatus manufacturer. The fire pump and the plumbing shall be painted metallic silver.

HOSE THREADS

The hose threads shall be National Standard Thread (NST) on all base threads on the apparatus intakes and discharges.

WATER TANK TO PUMP LINE

One (1) 3" water tank to the rear mounted fire pump line shall be provided with a full flow quarter turn ball valve, 4" piping, and with flex hose and stainless steel hose clamps. The tank to pump line shall be equipped with a check valve to prevent pressurization of the water tank.

The line shall be flow tested during the fire pump testing and shall meet applicable requirements of NFPA standards.

The tank to pump valve shall be controlled at the pump operator's panel.

The valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.

One (1) Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature shall be provided on the intake. The handle shall be equipped with a color-coded name plate.

FIRE PUMP TO WATER TANK FILL LINE

One (1) 2" fire pump to water tank refill and pump bypass cooler line shall be provided. The valve shall be a full flow quarter turn ball valve with 2" piping and flex hose to tank. The valve control handle shall have a nameplate located near the valve control.

The valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

One (1) Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature shall be provided on the intake. The handle shall be equipped with a color-coded name plate.



FIRE PUMP SPLIT SHAFT DRIVESHAFTS AND INSTALLATION

The mid-ship split shaft fire pump shall be installed and shall include installation of the fire pump, modification and/or fabrication of new drivelines and all pump-mounting brackets. The drive shaft(s) shall be spin balanced prior to final installation.

UNDERWRITERS LABORATORIES FIRE PUMP TEST

The pump shall undergo an Underwriters Laboratories Incorporated test per applicable sections of NFPA standards, prior to delivery of the completed apparatus.

The UL acceptance certificate shall be furnished with the apparatus on delivery.

Pump shall be tested at a maximum volume of 1515 GPM so they can get extra payment for using the truck on strike teams.

FIRE PUMP TEST LABEL

A fire pump performance and rating label shall be installed on the fire apparatus pump panel. The label shall denote levels of pump performance and testing completed at factory. These shall include GPM at net pump pressure, RPM at such level, and other pertinent data as required by applicable NFPA standards. In addition, the pressure control device, tank to pump flow tests, and other required testing shall be completed.

In addition, the entire pump, suction and discharge passages shall be hydrostatically tested to a pressure as required by applicable NFPA standards. The pump shall be fully tested at the pump manufacturer's factory to the performance specifications as outlined by applicable NFPA standards. Pump shall be free from objectionable pulsation and vibration.

If applicable, the fire pump shall be tested and rated as follows:

- 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% or rated capacity at 165 pounds net pressure.

The pump test label shall state 1515 GPM at the RPM that it tested at.

INTAKE RELIEF/DUMP VALVE

One (1) Elkhart Model 40, 2-1/2" intake relief/dump valve preset at 125 psi shall be permanently installed on the suction side of the fire pump. The valve shall have an adjustment range of 75 psi to 250 psi, and shall be designed to automatically self-restore to a non-relieving position when excessive



pressure is no longer present.

Discharge side of the intake relief valve shall be plumbed to the side the apparatus, away from the pump operator, and shall terminate with a 2-1/2" NST male thread. The outlet shall be marked with an engraved tag "Intake pressure relief outlet - Do Not Cap".

FIRE PUMP COOLING

The fire pump shall be equipped with 3/8" cooling line from the pump to the water tank. This pump cooling re-circulation line shall be controlled at the pump panel by a quarter-turn in-line ball valve with mini-twist control handle. The control handle shall be labeled "PUMP COOLING". There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.

FIRE PUMP COOLING

The fire pump shall be equipped Hale Model TRV-L, thermal bypass cooling system. The system shall automatically dump water through a .375" discharge line to the ground when pump water temperature exceeds 120 degrees. A warning light and alarm shall be installed on the pump panel with proper label installed. The valve shall be equipped with an integral strainer and shall reset automatically.

Discharge from the thermal relief valve shall shoot water at the pump operator's feet under the left running board.

CHASSIS ENGINE HEAT EXCHANGER COOLING SYSTEM

The apparatus shall be equipped with a heat exchanger for supplementary chassis engine cooling during fire pump operations. A manually operated quarter-turn in-line ball valve with mini-twist control handle mounted at the pump panel shall direct water from the fire pump to the heat exchanger that is mounted in the engine radiator cooling hose. The system shall provide cooling water from the fire pump to circulate around the engine radiator coolant without mixing or coming in direct contact with the engine coolant. The unit shall be installed by the chassis manufacturer and connected to the plumbing system by the fire apparatus manufacturer.

The control shall be identified with a chrome bezel label assembly labeled, "AUXILIARY ENGINE COOLER".

LEFT SIDE -- 2-1/2" GATED INTAKE

One (1) 2-1/2" gated suction intake shall be installed on left side pump panel to supply the fire pump from an external water supply. The control valve shall be a quarter turn ball valve and shall have 2-1/2" NST female thread of chrome plated brass.

The intake shall be equipped with a 3/4" drain and bleeder valve. A nameplate label and removable



screen shall be installed.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) 2-1/2" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and plastic covered cable securement.

Note: All caps and plugs shall have plastic covered cables in lieu of chains.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

The valve shall be equipped with one (1) manually operated, swing-type manual control located adjacent the intake. The valve shall be equipped with a color-coded name plate.

RIGHT SIDE -- 2-1/2" GATED INTAKE

One (1) 2-1/2" gated suction intake shall be installed on right side pump panel to supply the fire pump from an external water supply. The control valve shall be a quarter turn ball valve and shall have 2-1/2" NST female thread of chrome plated brass.

The intake shall be equipped with a ¾" drain and bleeder valve. A nameplate and removable screen shall be installed.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) 2-1/2" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and plastic covered cable securement.

Note: All caps and plugs shall have plastic covered cables in lieu of chains.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

The valve shall be equipped with one (1) manually operated, swing-type manual control located adjacent the intake. The valve shall be equipped with a color-coded name plate.



2" DISCHARGE FRONT CENTER BUMPER

One (1) 2" discharge shall be installed at front center bumper area with chrome or stainless steel swivel outlet with 1-1/2" NST male threads. The valve control shall be on pump panel and a nameplate label provided at valve control area.

The plumbing shall be flexible hose with abrasion resistant support mountings. Auxiliary low point drains shall be provided on the discharge line.

Drains shall not be mounted within the approach angle or in a location that would allow them to become damaged if driving off highway.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close.

The hose connection for the front discharge shall be swivel type located above the front bumper deck level.

The swivel shall be located out board of the frame extension on the driver's side and be located away from the frame enough (6" - 8") so the hose will not kink when connected and stored in the compartment.

The specified valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

THREE (3) 1-1/2" CROSSLAY DISCHARGES

Three (3) pre-connect 1-3/4" hose crosslays shall be installed over pump enclosure, with quarter turn 2" diameter ball valves. The outlets shall be a 2" NPT female swivel x 1-1/2" male with NST hose threads.



The crosslay hosebeds shall have smooth aluminum sides. The hosebed decking shall be constructed with slots integrated into the hosebed.

Each hosebed shall provide for a minimum capacity of 250 feet of 1-3/4" diameter double jacket hose with nozzle, for hose provided by the fire department.

Each hosebed shall provide for a minimum capacity of 250 feet of 1-3/4" diameter double jacket hose with nozzle, for hose provided by the fire department.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

The specified valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

FLOWMETER & PRESSURE INDICATOR - LED BACKLIT

Three (3) Fire Research Insight model FPA402-*** combination digital flowmeter and pressure indicator kit shall be installed. The kit shall include a flowmeter/pressure display module, paddlewheel flow sensor, flow sensor housing with a mount for 4" plumbing, pressure sensor, and interconnecting cables. The display module case shall be waterproof, manufactured of anodized machined aluminum, and have dimensions not to exceed 4 3/8" high by 4 3/8" wide by 3 1/2" deep. The module shall be backlit and have a digital LED display for flow with super bright digits more than 3/8" high. Flow rate shall be displayed in GPM. The module shall have an analog display for pressure with an expanded scale in the normal operating range for more accurate readings. The pressure indicator input and movement shall be electronic. Pressure shall be displayed in PSI.

FLOWMETER and PRESSURE INDICATOR COLOR CODED BEZEL

Fire Research –C00 option for chrome powder coat shall be applied to the flowmeter and pressure display bezel.



FLOWMETER SENSOR MOUNT

A sensor mount for two inch (2") pipe, compatible with Fire Research flow meter sensor, shall be installed.

CROSSLAY HINGED COVER WITH END FLAPS

The crosslay hosebed shall be equipped with a single aluminum diamond plate hinged cover with vinyl end flaps with hook & loop fasteners. The cover shall have rubber bumpers, latching devices, and lift up handle on each end of the cover.

The hosebed cover shall be labeled, "Not a Standing or Walking Surface", per NFPA.

The color of the flaps shall be black.

The flaps shall be secured using straps with seat belt style latches as shown in the pictures sent in with the production file.

CROSSLAY HOSE BED TRIM

The crosslay hosebed shall be equipped stainless steel trim, one on each end of the hosebed.

CROSSLAY HOSEBEDS

Crosslay hosebed(s) shall be mounted over the upper pump panel or gauge panel in the upper portion of the pump enclosure. The crosslay hosebed shall be approximately 12" from the top of the pump enclosure.

LEFT SIDE PUMP PANEL -- 2-1/2" DISCHARGE

Two (2) 2-1/2" discharge shall be installed on the left side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

Two (2) chrome plated reducing adapter with rocker lugs shall be provided with 2-1/2" NST rigid female x 1-1/2" NST male hose threads.

The adapter is for the forward 2-1/2" LHS discharge.



Two (2) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

One (1) 1-1/2" NST rocker lug chrome plated vented cap and plastic covered cable securement shall be provided.

The cap for the forward 2-1/2" LHS discharge.

Note: All caps and plugs shall have plastic covered cables in lieu of chains.

One (1) 2-1/2" NST rocker lug chrome plated vented cap and plastic covered cable securement shall be provided.

Note: All caps and plugs shall have plastic covered cables in lieu of chains.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

Two (2) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

RIGHT SIDE PUMP PANEL -- 2-1/2" DISCHARGE

One (1) 2-1/2" discharge shall be installed on the right side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) chrome plated reducing adapter with rocker lugs shall be provided with 2-1/2" NST rigid



female x 1-1/2" NST male hose threads.

One (1) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

One (1) 1-1/2" NST rocker lug chrome plated vented cap and plastic covered cable securement shall be provided.

Note: All caps and plugs shall have plastic covered cables in lieu of chains.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

RIGHT SIDE PUMP PANEL -- 4" DISCHARGE

One (1) 4" discharge shall be installed on the right side pump panel area and shall be controlled by a full flow 4" slow-close quarter turn ball valve. The discharge shall have 4" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) lightweight aluminum elbow with 30 degree slant shall be provided. Threads shall be 5" Storz with lugs and manual locks x 4" female swivel NST with rocker lugs.

One (1) 5" lightweight aluminum Storz cap with cable or chain securement shall be provided.

The specified valve shall be an Akron 8000 Series four-inch (4") valve.



One (1) Akron valve equipped with an Akron manually operated hand wheel control with dial type position indicator shall be provided on the specified 4" discharge. A color-coded name plate installed over the valve control.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

REAR LEFT SIDE -- 2-1/2" DISCHARGE

One (1) 2-1/2" discharge shall be installed on the left side rear panel of the apparatus body and shall be controlled by a quarter turn ball valve on the pump panel. The discharge shall have 2-1/2" NPT x 2-1/2" NST male hose threads. The outlet shall be equipped with an engraved nameplate label shall be installed adjacent the valve control handle.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

One (1) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

One (1) 2-1/2" NST rocker lug chrome plated vented cap and plastic covered cable securement shall be provided.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

FLOWMETER & PRESSURE INDICATOR - LED BACKLIT

Three (3) Fire Research Insight model FPA402-*** combination digital flowmeter and pressure indicator kit shall be installed. The kit shall include a flowmeter/pressure display module, paddlewheel



flow sensor, flow sensor housing with a mount for 4" plumbing, pressure sensor, and interconnecting cables. The display module case shall be waterproof, manufactured of anodized machined aluminum, and have dimensions not to exceed 4 3/8" high by 4 3/8" wide by 3 1/2" deep. The module shall be backlit and have a digital LED display for flow with super bright digits more than 3/8" high. Flow rate shall be displayed in GPM. The module shall have an analog display for pressure with an expanded scale in the normal operating range for more accurate readings. The pressure indicator input and movement shall be electronic. Pressure shall be displayed in PSI.

FLOWMETER and PRESSURE INDICATOR COLOR CODED BEZEL

Fire Research –C00 option for chrome powder coat shall be applied to the flowmeter and pressure display bezel.

FLOWMETER SENSOR MOUNT

A sensor mount for two inch (2-1/2") pipe, compatible with Fire Research flow meter sensor, shall be installed.

3" MONITOR DISCHARGE

One (1) 3" discharge shall be piped to the area over the pump enclosure with 3" NPT male threads provided. The pipe shall be equipped with Victaulic couplings (if necessary) and shall be properly secured to prevent movement when a monitor or deck gun is attached. The quarter turn ball valve shall be controlled on pump panel.

A color coded nameplate label shall be provided adjacent the valve control handle.

The monitor piping shall be located on the passenger's side of the dunnage compartment.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

An Innovative Controls 3/4" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close.

STREAM SHAPER CRADLE

A cradle to support the FD supplied stream shaper shall be manufactured and provided.



Please see pictures in file and sketch with dimensions.

FD to supply the dimensions.

TELESCOPING MONITOR PIPE

One (1) Task Force Tips model # XG18VL-XL manually telescoping waterway shall be installed. The waterway shall be capable of being lowered to deck level (or into a monitor well) for storage and transportation and shall be capable of being raised to an extended height of 18" by lifting a quick release latch located at the base of the extension tube. This latching device shall be capable of locking the waterway in either the raised or lowered position while maintaining the ability to horizontally rotate the monitor device 360 degrees.

A sensor shall be located on the waterway that signals a 12 volt indicator light installed in the cab to illuminate to indicate that the monitor is raised.

The aluminum riser shall have a 3" waterway; hardcoat anodized finish and be furnished with a 3" Victaulic inlet and a 3" XL (TFT Crossfire) outlet.

At the end of the telescoping water way shall be an adapter to fit the fire department supplied TFT XFC42 deck gun.

The telescoping water way shall be wired into the cab and body door warning system and show up on the Vista screens.

The height of the telescoping water way shall allow the fire department supplied monitor to sit on top of the diamond plate dunnage compartment cover.

The specified valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.

One (1) Akron valve equipped with an Akron manually operated hand wheel control with dial type position indicator shall be provided on the specified 3" discharge. A color-coded name plate installed over the valve control.

One (1) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

FOAM SYSTEM-DIRECT INJECTION

Fire Research TurboFoam model TFC300 direct injection foam proportioning system shall be installed. The system kit shall include a control module, a foam concentrate pump assembly with an electric motor, an electrical flush valve, a discharge flow sensor with mount, check valves, foam concentrate and



flush line strainers, cables, and instruction plates including operations, system diagram, and specifications.

The microprocessor controlled system shall automatically maintain a selected foam percent mixture at the pump discharge regardless of water flow fluctuations. It shall monitor the water flow through the discharge and control the flow rate of foam concentrate from the foam tank. The pump shall inject concentrate under pressure into the discharge side of the pump to create the correct foam solution. Discharge flow rate and foam concentrate percent shall be displayed. Total water and total foam concentrate flow shall be displayed with the push of a button.

The control module shall be panel mounted, waterproof, and have dimensions not to exceed 4 7/8" high by 4 7/8" wide by 2 1/4" deep. The push button controls, digital discharge flow rate, foam percent, and message displays shall be located on the front of the control module. A USB port shall be accessed from the rear.

The designated foam discharges shall be the three (3) 1-3/4" crosslay discharges and the front bumper discharge.

The system shall provide the following capabilities:

Foam concentrate pump:	6.2 GPM	
Maximum injection pressure:	400 PSI	
	<u>A Foam Program</u>	<u>B Foam Program</u>
Proportioning ratio:	0.1 to 1.0 %	0.5 to 10

The foam pump assembly shall have an overall length less than 23 1/2", width less than 10 1/4", and a height less than 8 7/8". The components of the assembly shall be mounted to a base and include a pump control box, a pump with an electric motor, a pressure relief valve, and a calibration bypass valve. The pump shall be a triplex plunger pump constructed of a die-cast body with cooling fins, a forged brass head, solid ceramic plungers, and viton seals. The pump shall have a custom electric washguard motor specifically designed for wet environments. The 1 hp pump motor shall operate at 12 volts DC and draw 100 amps.

FOAM SYSTEM CHECK VALVE INJECTOR

A Fire Research TurboFoam 1" foam tank check valve shall be installed.

FOAM SYSTEM DISCHARGE CHECK VALVE ASSEMBLY



A Fire Research TurboFoam discharge check valve assembly that includes a flow sensor, water way check valve, a check valve injector, and a drain shall be installed. It shall fit a 3" discharge pipe.

FOAM SYSTEM

A Fire Research TurboFoam side mount tank float switch shall be installed.

1" FOAM TANK CONTROL -- CLASS A

One (1) Class A foam tank shall be plumbed with 1" valve and corrosion resistant hose from the foam tank to the foam inlet of the foam system. The manually opened valve shall be provided behind the pump panel with a label.

INTEGRAL CLASS A FOAM TANK -- 20 GALLON

One (1) twenty (20) gallon Class A foam tank shall be installed within the water tank. The non-corrosive foam tank shall meet applicable sections of NFPA standards. The foam concentrate tank shall be provided with sufficient wash partitions so that the maximum dimension perpendicular to the plane of any partition shall not exceed 36 inches. The swash partition(s) shall extend from wall to wall and cover at least 75 percent of the area of the plane of the partition.

The foam concentrate tank shall be provided with a fill tower or expansion compartment having a minimum area of 12 square inches and having a volume of not less than 2 percent of the total tank volume. The fill tower opening shall be protected by a completely sealed air-tight cover. The cover shall be attached to the fill tower by mechanical means. The fill opening shall be designed to incorporate a 1/4 inch removable screen and shall be located so that foam concentrate from a five (5) gallon container can be dumped directly to the bottom of the tank to minimize aeration without the use of funnels or other special devices.

The foam tank fill tower shall be equipped with a pressure/vacuum vent that enables the tank to compensate for changes in pressure or vacuum when filling or withdrawing foam concentrate from the tank. The pressure/vacuum vent shall not allow atmospheric air to enter the foam tank except during operation or to compensate for thermal fluctuations. The vent shall be protected to prevent foam concentrate from escaping or directly contacting the vent at any time. The vent shall be of sufficient size to prevent tank damage during filling or foam withdrawal.

A color coded label or visible permanent marking that reads "FOAM TANK FILL" shall be placed at or near any foam concentrate tank fills opening. A label shall be placed at or near any foam concentrate tank fill opening that specifies the type of foam concentrate the system is designed to use. Any restrictions on the types of foam concentrate that can be used with the system shall also be stated, and a warning message that reads "WARNING: DO NOT MIX BRANDS AND TYPES OF FOAM."



The foam concentrate tank outlet connection shall be designed and located to prevent aeration of the foam concentrate and shall allow withdrawal of 80 percent of the foam concentrate tank storage capacity under all operating conditions with the vehicle level.

FOAM TANK DRAIN -- UNDER TANK

The foam tank shall have one (1) 1" gate valve drain provision installed.

FOAM SYSTEM DESIGN AND PERFORMANCE REQUIREMENTS

The proportioning system shall be capable of proportioning foam concentrate in accordance with the foam concentrate manufacturer's recommendations for the type of foam concentrate used in the system over the system's design range of flow and pressures. The foam proportioning system water flow characteristics and the range of proportioning ratio shall be specified as noted herein. The latest foam system shall be in compliance with applicable NFPA standards as it relates to this specified system

Plumbing and Strainer

The foam concentrate supply line shall be non-collapsible. A means shall be provided to prevent water back flow into the foam proportioning system and the foam concentrate storage tank.

A strainer or filter shall be provided on the foam concentrate supply side of the foam proportioner to prevent any debris that might affect the operation of the foam proportioning system from entering the system. The strainer assembly shall consist of a removable straining element, housing, and retainer. The strainer assembly shall allow full flow capacity of the foam supply line.

Flushing

A foam concentrate system flush line shall be provided as required by the foam system manufacturer. A means shall be provided in the flush line to prevent water backflow into the foam concentrate tank or water tank during the flushing operation.

Foam System Controls

The foam proportioning system operating controls shall be located at or near the pump operator's position and shall be clearly identified. Foam proportioning system shall be provided with accessible controls to completely flush the system with water according to the manufacturer's instructions.

Labels and Instructions

An instruction plate shall be provided for the foam proportioning system that include, at a minimum,



pipingschematic of the system and basic operating instructions. Labels that are marked clearly with the identification and function shall be provided for each control, gauge, and indicator related to the foam proportioning system.

A label shall be provided on the pump operator's panel that identifies the type of foam concentrate that the foam proportioning system is designed to use. It shall also state the minimum/maximum foam proportioning rate at the minimum/maximum foam proportioning rated system flow and pressure.

Two (2) copies of an operations and maintenance manual shall be provided. They shall include a complete diagram of the system together with operating instructions and details outlining all recommended maintenance procedures.

Foam System Testing

The accuracy of the foam proportioning system shall be certified by the foam equipment manufacturer and also tested by the installer prior to delivery of the apparatus in compliance to NFPA standards.



APPARATUS BODY SPECIFICATIONS

SIDE MOUNT PUMP ENCLOSURE

The side mount pump enclosure shall be removable and supported from the chassis frame rails. This enclosure will allow independent flexing of the pump enclosure from the body and allow for quick removal. The support structure shall be constructed of extruded aluminum tubing and angle.

All pump suction and discharge controls are to be mounted on the driver side pump operator's panel so as to permit operation of the pump from a central location. The fire pump, valves and controls shall be accessible for service and maintenance as required by applicable sections of NFPA standards.

The "master" gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel, allowing access to the backside of all gauges and gauge lines. The individual gauges shall be mounted inline with the control handle or adjacent to the control handle. Panel is to include a stainless steel piano hinge, flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened.

The following controls and equipment as specified in the specifications, shall be provided on the pump panel or within the pump enclosure:

- Primer.
- Pump and plumbing area service lights.
- Pressure control device and throttle control.
- Fire pump and engine instruments.
- Pump intakes and discharge controls.
- Master intake and discharge gauges.
- Tank fill control.
- Tank suction control.
- Water tank level gauge.
- Pump panel lights.

Crosslay Installation

The area atop the pump enclosure shall be notched for the installation of a crosslay hose bed. The hosebed shall have smooth sides and a perforated floor to allow for drainage. Provisions shall be provided to secure hose and equipment per requirements of applicable NFPA standards.



ENCLOSED DUNNAGE COMPARTMENT OVER PUMP ENCLOSURE

One (1) enclosed dunnage compartment shall be located on the top of the pump module. The compartment will be constructed as large as space permits with removable slip resistant floor or decking in the base of the compartment.

A hinged door constructed of slip resistant aluminum diamond plate shall be installed on the top of the compartment on the driver's side and be as wide as space permits. The door shall have a positive style D-ring handle and latch for easy opening, gas shock, stay arm (lock) to hold the door open and a safety chain to prevent damage to the door in strong wind conditions. The hinge shall be located at the front of the dunnage compartment just behind the cab with the door opening from the rear of the compartment.

The officer's side of the dunnage compartment shall be enclosed with a bolted slip resistant aluminum diamond plate panel. The specified deck gun shall be located just above the panel when in the down position. Storage shall be provided under the bolted panel from the hinged door on the driver's side.

Please see pictures of the department's existing pumpers located in the production file showing what is required.

Each side of the dunnage compartment shall have a vertically hinged diamond plate door providing access into the dunnage compartment from each side.

Full length removable shelf to the over pump compartment. The shelf is to be mounted 10" from the floor of the compartment and will need to be removable if needed.

LEFT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The left side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab.

The running board shall be constructed of aluminum tread plate, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance to applicable sections of NFPA requirements.

RIGHT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The right side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab.

The running board shall be constructed of aluminum tread plate, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance to applicable sections of NFPA requirements.



FLOATING HOSEWELL COMPARTMENT -- RIGHT SIDE

One (1) floating hosewell shall be recessed in the right side running board of the apparatus pump panel. The hosewell shall be constructed of aluminum treadplate material and shall be provided with drain holes drilled in each bottom corner with plastic grating on the floor.

The hose and couplings shall be secured in compliance to applicable NFPA standards.

Capacity for the following purchaser supplied hose:

The tray shall hold 50' of 5" LDH fire hose.

The bottom edges are to be angled to help line up and insert the floating tub when reinstalling it into the running board.

The floating trays must clear the drain valves.

HOSE WELL SECUREMENT

Black nylon straps and spring loaded alligator type clamps shall be provided for the securement of the hose in the running board hose well.

Black nylon straps and spring loaded alligator type clamps shall be provided for the securement of the hose in the running board hose well.

GAUGE PANEL -- LEFT SIDE UPPER

A gauge panel shall be provided on the upper left side of the side mount pump enclosure. The gauge panel shall be approximately 18" high and as wide as possible. The gauge panel shall be constructed of black thermoplastic covered aluminum and hinged. The gauge panel shall be held in the closed position with push button type latches.

PUMP ENCLOSURE ACCESS DOOR -- RIGHT SIDE UPPER

A pump panel access door shall be provided on the upper right side of the side mount pump enclosure. The access door shall be approximately 18" high and as wide as possible. The door shall be constructed of black thermoplastic covered aluminum with push button type latches.

FRONT ACCESS PUMP PANEL

A removable front access panel shall be installed on the front of the pump enclosure of the apparatus. The panel shall be constructed of aluminum tread plate and be fastened to the pump enclosure with push button or D-ring type latches.

The access area shall be as large as possible.



PUMP PANEL -- SIDE MOUNT

The pump operator's panel, along with the lower left hand and right hand pump panels shall be constructed of black thermoplastic coating aluminum material.

LEFT SIDE PUMP PANEL -- LATCHES

The center section of the pump panel installed on the left hand side of the pump enclosure below the push pull handles and above the drains shall be fastened to the pump enclosure with push button style latches.

The center section of the pump panel installed on the left hand side of the pump enclosure below the push pull handles and above the drains shall be fastened to the pump enclosure with push button style latches.

The drain valves must be recessed to clear the floating hose well trays.

RIGHT SIDE PUMP PANEL -- LATCHES

The pump panel installed on the right hand side of the pump enclosure shall be fastened to the pump enclosure with push button style latches.

The pump panel installed on the right hand side of the pump enclosure shall be fastened to the pump enclosure with push button style latches.

The drain valves must be recessed to clear the floating hose well trays.

PUMP PANEL COLOR TRIM PANELS

Innovative Controls intake and discharge trim rings shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and discharge ports with color and verbiage. These trim rings are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards

LABELS

Safety, information, data, and instruction labels for apparatus shall be provided and installed at the operator's instrument panel.

The labels shall include rated capacities, pressure ratings, and engine speeds as determined by the certification tests. The no-load governed speed of the engine, as stated by the engine manufacturer,



shall also be included.

The labels shall be provided with all information and be attached to the apparatus prior to delivery.

COLOR CODED PUMP PANEL LABELING AND NAMEPLATES

Discharge and intake valve controls shall be color coded in compliance to guidelines of applicable sections of NFPA standards.

All labels, instruction panels and warnings shall be installed on the pump panel for safe operation of the pumping equipment and controls using Innovative Controls labels and bezel assemblies. These bezel assemblies will be used to identify intake and discharge controls with color and verbiage. The label and bezel assemblies are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards

MIDSHIP PUMP PANEL LIGHTS -- LEFT SIDE

Three (3) Grote #01-61F8-70 low profile LED lights with clear lenses shall be installed under an instrument panel light hood on the left side pump panel. The lights shall be controlled by a switch located on the operator's instrument panel.

The instrument panel light hood shall be capable of being used as a step.

MIDSHIP PUMP PANEL LIGHTS -- RIGHT SIDE

Three (3) Grote #01-61F8-70 low profile LED lights with clear lenses shall be installed under an instrument panel light hood on the right side pump panel. The lights shall be controlled by a switch located on the operator's instrument panel.

The instrument panel light hood shall be capable of being used as a step.

PUMP PANEL LIGHTS

One (1) pump panel light shall be illuminated at the time the fire pump is engaged into operation. The remaining lights shall be controlled by a switch located on the operator's instrument panel.



MASTER DISCHARGE AND INTAKE GAUGES

Two (2) 4" diameter Noshok discharge pressure and intake gauges (30"-0-600 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

The master gauges shall have clear scratch resistant molded crystals with captive O-ring seals shall be used to ensure distortion free viewing and to seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy. A polished chrome-plated brass bezel shall be provided to prevent corrosion and protect the lens and gauge case.

TEST TAPS

Test taps for pump intake and pump pressure shall be provided on the pump instrument panel and be properly labeled.

WATER/FOAM TANK LEVEL GAUGE - PUMP PANEL

The apparatus shall be equipped with an Innovative Controls SL Series Tank Level Monitor System shall be installed. The display model # shall be 3030359-04. The system shall include an electronic dual water/foam display module, two (2) pressure transducer-based sender units, and two (2) 15' connection cables. The display module shall show the volume of water/foam in the tanks using 10 superbright easy-to-see LEDs arrangement. The 10-LED arrangement shall form a straight vertical pattern to easily distinguish the tank level at a glance. Tank level indication is enhanced by the use of green LEDs at the full and near-full levels, amber LEDs between $\frac{3}{4}$ and $\frac{1}{4}$ tank levels, and red LEDs at the near-empty and empty levels. The electronic dual water/foam display module shall be waterproof and shock resistant being encapsulated in a urethane-based potting compound. The potted dual water/foam display module shall be mounted to a chrome plated panel-mount bezel with a durable easy-to-read polycarbonate insert featuring blue graphics and a water icon for water and red graphics and a foam icon for foam.

All programming functions shall be accessed and performed from the front of the display module. The programming includes self-diagnostics, manual or self-calibration, and networking capabilities to connect remote slave displays. Low tank level warnings shall include flashing red LEDs starting below the $\frac{1}{4}$ level and an output for an audible alarm.

The display module shall receive an input signal from a pressure transducer. This stainless steel sender unit shall be installed on the outside of the water tank near the bottom. All wiring, cables and connectors shall be waterproof without the need for sealing grease.



Location of the water/foam tank level display shall be at the pump panel.

The water/foam gauge on the pump panel shall be wired to the ignition circuit and be on even when the pump is not engaged.

WATER TANK LEVEL LIGHTS

Two (2) Whelen PS-TANK vertically mounted LED lights shall be installed one each side of the apparatus to allow for monitoring the water tank level from a distance.

They shall be configured as follows:

- GREEN - Position 1 indicates FULL
- BLUE - Position 2 indicates 3/4
- AMBER - Position 3 indicates 1/2
- RED - Position 4 indicates 1/4

Each light shall remain illuminated until the water level drops below full 3/4, 1/2, or 1/4 levels. When the level drops below 1/4 the RED light will flash to indicate an empty tank. The Whelen PS-TANK water tank level lights shall be controlled with a Innovatic Controls remote driver.

The lights shall be side facing at the upper rear portion of the cab.

Unlike the water/foam gauge on the pump panel, these water tank gauges shall activate only when the pump is in gear.

AIR HORN PUSH-BUTTON

One (1) push button with a label shall be installed on the pump instrument panel to operate the air horns.

HANDRAIL SIDE PUMP PANEL

Two (2) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and horizontally mounted, one (1) each side on the side pump panel.

WATER TANK - 750 GALLON

The apparatus shall be equipped with a seven-hundred-fifty (750) gallon polypropylene water tank. The tank shall be equipped with a four-inch (4") overflow pipe.

The apparatus shall be equipped with a polypropylene water tank. The tank body and end bulkheads shall be constructed of .5" thick, polypropylene, nitrogen-welded and tested inside and out. Tank construction shall conform to applicable NFPA standards. The tank shall carry a lifetime warranty.



The transverse and longitudinal .375" thick swash partitions shall be interlocked and welded to each other as well as to the walls of the tank. The partitions shall be designed and equipped with vent holes to permit air and liquid movement between compartments.

The .5" thick cover shall be recessed .375" from the top of the side walls. Hold down dowels shall extend through and be welded to both the covers and the transverse partitions, providing rigidity during fast fill operations. Drilled and tapped holes for lifting eyes shall be provided in the top area of the booster tank.

A combination vent/water fill tower shall be provided at front of the tank. The 0.5" thick polypropylene fill and overflow tower shall be equipped with a hinged lid and a removable polypropylene screen. The overflow tube shall be installed in fill tower and piped with a minimum schedule 40 PVC pipe through the tank.

The water tank sump shall be located in the forward area of the tank. There will be a schedule 40 polypropylene tank suction pipe from the front of the tank to the tank sump. The tank drain and clean out shall be located in the bottom of the tank sump. The sump shall have a minimum 3" threaded outlet on the bottom to be used for a combination clean out and drain.

The pump to tank refill connection shall be sized to mate with tank fill discharge line. A deflector shield inside the tank will also be provided.

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4" x 1" and a hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2" x 2" x 1/4" mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4" x 4" x 1/4" by 6" high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum



dimensions of 3" x 3" x 1/4" and shall be approximately 6" to 12" long. These brackets must incorporate rubber isolating pads with a minimum thickness of 1/4" inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank.

Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

The water tank shall be certified for the capacity of the water tank prior to delivery of the apparatus. This capacity shall be recorded on the manufacturer's record of construction and the certification shall be provided to the purchaser when the apparatus is delivered.

WATER TANK WARRANTY

The tank manufacturer warrants each tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle (vehicle must be actively used in fire suppression). The tank must be installed in accordance with the manufacturer's installation manual. Every tank is thoroughly inspected and tested for leaks before leaving our facility. Should any problems develop with your booster/foam tank and will not meet performance criteria during the service life of the vehicle, notify the tank manufacturer in writing or call our TOLL FREE SERVICE HOT LINE. Provide the manufacturer with the serial number and a description of the problem. If the tank problem would render the truck out of service, the tank manufacturer will dispatch a service technician WITHIN 48 HOURS (2 DAYS) to repair the tank. (This time period is for North America only)

We will repair, or at our option, replace the tank with a new tank. The tank manufacturer will cover customary and reasonable costs to remove and install the tank. This warranty will not cover tanks that have been improperly installed, misused or abused, and the serial number must not have, been altered, defaced or removed. The tank manufacturer will not cover any unauthorized third party repairs or alterations. Any of these actions may void the warranty.

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. ADDITIONALLY, THIS WARRANTY IS IN LIEU OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF THE TANK MANUFACTURER.

This warranty contains the entire warranty. It is the sole warranty and price agreements or representation, whether oral or written, are either merged herein or expressly cancelled. The tank



manufacture neither assumes, nor authorizes any person supposing to act on its behalf, to change, nor assume for it, any warranty or liability concerning its product.

IN NO EVENT WILL THE TANK MANUFACTURER BE LIABLE FOR AN AMOUNT IN EXCESS OF THE PRESENT RETAIL, PURCHASE PRICE PLUS INSTALLATION AND REMOVAL COST OF THE BOOSTER TANK, FOR ANY LOSS OR DAMAGE, WHETHER DIRECT OR INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHERWISE ARISING OUT OF FAILURE OF ITS PRODUCT.

This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Some states do not allow exclusion or limitation of incidental or consequential damage, so the above limitation or exclusion may not apply to you. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

WATER TANK FILL TOWER

A fill tower measuring approximately 10" x 10" square shall be provided on the water tank.

Both the tank fill and foam fill towers to be located at the front driver's side of the hose bed.

Tank suction shall be located in a sump assembly located below the bottom of the tank, properly baffled to prevent surging of water. A 3" cleanout plug shall be provided in the bottom of the tank sump.

HOSEBED WIDTH

The width of the pumper body hosebed shall be 71".

ALUMINUM HOSEBED GRATING

The hose bed compartment deck shall be constructed entirely from maintenance-free, extruded aluminum slats. The slats shall have an anodized, radiused ribbed top surface. The slats shall be of widths approximately 3/4" high x 6" wide, space 1/2" apart and shall be welded into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose.

HOSE BED STORAGE CAPACITY

The hose bed shall be designed to have a storage capacity for a minimum of 30 cubic feet of fire department supplied fire hose.

The hose bed shall be designed to have storage capacity for eight (8) 50-ft lengths of 2.5" Double Jacket fire hose.

The hose load will be as followed from Drivers to officer's side. 800' of 3" hose split in two rows of 400', 1000' of 5", 400' of 2.5 split into two rows of 200' above the ladder storage.



The hose bed shall be designed to have storage capacity for sixteen (16) 50-ft lengths of 3" Double Jacket fire hose.

The hose bed shall be designed to have storage capacity for ten (10) 100-ft lengths of 5" LDH Single Jacket rubber fire.

ALUMINUM HOSEBED DIVIDER

Three (3) adjustable hosebed divider constructed of .250" aluminum shall be installed on the apparatus.

The divider shall be fully adjustable, mounted using extruded aluminum track at the rear and aluminum "C" channel tracks at the front of the divider for full side to side adjustment.

The center hose bed divider shall be fixed and support the specified hose bed covers.

The two (2) adjustable dividers shall be mounted to the driver's side of the center divider. The divider closest to the center divider shall stop short of the rear of the hose bed by approximately 2".

One (1) stationary hosebed partition shall be provided in the main hosebed, mounted left to right. The partition shall be fabricated of .190" smooth aluminum. Partition shall be bolted in place using stainless steel fasteners to allow for ease of removal or relocation.

The partition shall separate the tank fill and foam fill towers from the main hose bed and provide additional storage next to the towers.

ALUMINUM HOSE BED COVERS

Add: Additional hose bed door above the ladder storage. There will be a total of three hose bed doors accessible from the rear of truck. See engineering drawing # P5336 REV#8 for proper layout. Price includes additional hose bed covers and adding an additional 3 inches to the top of the body to accommodate the hose load

Four (4) polished aluminum tread plate hose bed covers shall be furnished. One (1) cover shall be hinged at the front of the body and when opened, allow access to the water tank fill and foam tank fill towers and additional fire department equipment stored in this area and in front of the transverse partition.

Three (3) hinged covers shall extend the full length and width of the main hose bed behind the transverse partition.

Covers shall be fabricated of .125" polished aluminum tread plate with cross bracing for maximum strength, and to support the weight of a firefighter standing on the covers when closed. The covers shall



be of the sloped design for proper water runoff. Each cover to be equipped with a full length stainless steel piano hinge.

Each hinged cover shall have a gas shock to hold the cover open with stay arm (lock) and a safety chain to prevent damage to the cover in strong wind conditions.

ALUMINUM HOSE BED COVERS

Add: Additional hose bed door above the ladder storage. There will be a total of three hose bed doors accessible from the rear of truck. See engineering drawing # P5336 REV#8 for proper layout

Four (4) polished aluminum tread plate hose bed covers shall be furnished. One (1) cover shall be hinged at the front of the body and when opened, allow access to the water tank fill and foam tank fill towers and additional fire department equipment stored in this area and in front of the transverse partition.

Three (3) hinged covers shall extend the full length and width of the main hose bed behind the transverse partition.

The front portion of the hose bed on the passenger's and next to the fill towers shall be designed to hold a fire department supplied Carlson Board. The size of the board is 58"L x 26"W x 8"D.

MANUALLY OPERATED ALUMINUM HOSEBED COVER

The polished aluminum treadplate hosebed covers extending the full-length and width of the main hosebed shall have lift up handles installed on each hose cover to manually open the hosebed covers.

HOSEBED LIGHTS

Eight (8) rubber shock mounted 4" round Grote LED lights shall be recessed into the underside of the hinged aluminum hose bed covers to provide illumination for repacking of fire hose. The 12 volt LED lights shall be automatically controlled by a switch which activates upon opening of the door. The lights shall also be connected to the hazard light in the chassis cab to indicate when the hose bed covers are in the open position. The lights shall be sealed, weather-tight, and equipped with electrical connectors for ease of removal or replacement.

Two (2) lights shall be located under each cover.

REAR VINYL FLAPS FOR ALUMINUM COVER

There shall be a vinyl flaps attached to each aluminum hosebed cover. The vinyl flaps shall cover the area on the rear of the hosebed from top to bottom. The flaps shall be independent of each other but attachable with velcro in the center.



The color of the flaps shall be black.

The flaps shall be secured using straps with seat belt style latches as shown in the pictures sent in with the production file.

HEAVY DUTY EXTRUDED ALUMINUM BODY

To prevent possible interaction of dissimilar metals and to reduce the weight of the completed apparatus, the body and ALL STRUCTURAL SUPPORTS shall be constructed entirely of aluminum sheet and aluminum extrusions.

Aluminum extrusions or sheet aluminum of smaller thicknesses or lesser grades to those specified herein are not acceptable.

All extrusions utilized in the body superstructure, substructure and framing shall be 6061-T6 alloy aluminum. For strength and rigidity, all aluminum sheets utilized in the apparatus body for structural support shall be a minimum of **3/16"** 5052-H32 alloy aluminum sheet. All extrusions shall be beveled at each joint and all seams shall be electrically seam welded using #5356 alloy aluminum wire.

FASTENERS

All fasteners use in the apparatus body shall be attached with Ny-Lok type fasteners.

All aluminum and stainless steel components shall be attached using stainless steel fasteners. Zinc or cadmium plated fasteners are not acceptable for use with any aluminum or stainless steel components on the vehicle.

Compartment door hinges, handrails and running boards shall be attached using a minimum of 1/4" diameter machine bolt fasteners. Fasteners used in nonstructural areas such as; door handles, trim moldings, gauge mounting, etc shall be 3/16" in diameter.

BODY SUPERSTRUCTURE CONSTRUCTION

All vertical and horizontal structural members of the outer apparatus body shall be constructed of no less than 4.00" by 12.00", 6061-T6 aluminum extrusions with a minimum .200" wall thickness fully welded together forming a unitized support system for the body and compartments. In order to provide a complete internal and integrated body super-structure, full height extruded structural members shall be provided at each corner of the apparatus and between each exterior equipment compartment.

EXTERIOR COMPARTMENT CONSTRUCTION

Compartment sides and walls shall be welded to the super-structure. Seams shall be sealed using an engineered grade polyurethane adhesive-sealant.



The compartments shall be designed to provide protected raceways for vertically hinged door fastener retention elements. This requirement shall eliminate the possibility of door hinge hardware from being damaged by or damaging equipment stored in the compartments.

The compartment door openings are to be full width of the compartment with no loss of space. The raceways shall be designed to allow door hardware removal by a single person with simple hand tools.

Full height access panels fastened with stainless steel fasteners shall be provided to access all wiring routed through vertical super-structure extrusions. There shall be no exposed wiring allowed within the compartment interiors.

Compartment flooring shall be constructed of a combination aluminum extrusion and aluminum treadplate welded in place to the extruded aluminum framework creating a double compartment floor for added strength. Due to the high usage and wear and tear caused by removal of equipment, only treadplate aluminum with a raised pattern will be acceptable for compartment flooring. Bolted or welded in smooth raw aluminum or painted aluminum does not meet the intent nor technical requirement of raised pattern treadplate.

The tops of the side exterior compartments shall be constructed of NFPA #1901 Standards compliant non-slip polished aluminum treadplate fastened to the body with stainless steel fasteners. Compartment tops that are welded in place do not meet the serviceability intent of this requirement.

SHELVING TRACKS

The vertical extrusions forming the framework of the side exterior compartmentation shall be designed to incorporate FULLY RECESSED adjustable shelving standards. Shelving tracks shall run full height of **ALL** side exterior equipment compartment.

The intent of this requirement is to allow full use of the available storage areas without the interference of shelving tracks extending into and reducing the interior widths of the compartments which will allow equipment to be stored within the full width of the compartment interiors.

Shelving, when specified, shall have a width of no less than .50" of the overall compartment width.

Adjustable shelving tracks welded or bolted onto interior walls of the compartments do not meet the intent of these specifications.

HOSE BODY CONSTRUCTION

To maintain strength and rigidity, the main hose body shall be completely framed with a minimum of 2.00" X 3.00" 6061-T6 alloy aluminum extrusions with a minimum wall thickness .156" on the three inch legs and a minimum wall thickness of .188" on the two inch legs. The hose body extrusions shall



be welded to the super-structure framework, becoming an integral portion of a complete unitized support system. Sheet metal or sheet aluminum with double or triple formed breaks, does not meet the technical requirement of the specification in providing a complete hosebody framework and are not acceptable. Sides shall be constructed of aluminum sheet welded to the framework.

ELECTROLYSIS CORROSION CONTROL

The apparatus shall be assembled using ECK or electrolysis corrosion control, on all high corrosion potential areas, such as door latches, door hinges, trim plates, fenderettes, etc. This coating is a high zinc compound that shall act as a sacrificial barrier to prevent electrolysis and corrosion between dissimilar metals. This shall be in addition to any other barrier material that may be used.

All 1/4" diameter and smaller screws and bolts shall be stainless steel with a powdered aluminum coating. This coating shall be bonded metallurgically to the stainless screws to prevent peeling and flaking. This coating is designed to reduce the potential for electrolysis and corrosion to occur where items are assembled and attached.

Due to the expected life of the vehicle, proposals will only be acceptable from manufacturers that include these corrosion features.

SIDE BODY HEIGHT

The side body height from the top of the rear tailboard to the top of the body shall be 88" high. This height may also be referred to as the hose bed riser height.

SIDE BODY HEADER

All high side compartment tops shall be NFPA approved non-slip treadplate with the side body header area above the compartment doors a smooth aluminum painted surface.

Lower or rear face compartments, if specified shall be provided with polished aluminum drip rails.

WHEEL WELL PANEL AND LINER

For ease of accessibility and maintenance, wheel well panels shall be double break formed painted smooth aluminum plate that is fully gasketed and bolted in place with stainless fasteners. Wheel wells shall be of the removable design so as to provide replacement in the event of damage. There shall be no visible bolt heads, retention nuts or fasteners on the exterior surface of the panel. Wheelwell panel shall be isolated from the apparatus body utilizing .25" nylon spacer blocks.

To fully protect the wheel well area from road debris and to aid in cleaning, a full depth (minimum of 24.00") radius wheel well liner constructed of exterior grade .25" black polyethylene sheet shall be provided. For ease of removal, the liner shall be held in place by a self-captive retention design. Due to



possible corrosion and contamination by road debris in the wheel well area a minimal number of mechanical fasteners shall be used to secure the wheel well liner at the front and rear edges.

The lower edge of the wheel well liner shall have an aluminum angle attached for the mounting the the rear mud flaps.

The angle shall be 1/4" in thickness to help prevent damage if a tire chain breaks.

FENDERETTES

The rear wheel wells shall be radius cut for a streamlined appearance. A polished type 304 stainless steel radius fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners with nylon isolators to prevent contact of the fastener with the wheelwell housing panel. A black rubber gasket shall be installed between the stainless fenderette and the apparatus body sides. Silicone caulking does not meet the intent nor the technical requirement of a solid gasket material in this area and is not acceptable.

ALUMINUM SUB-FRAME

The surface of the chassis frame rails shall be isolated from the apparatus substructure by an elastomeric isolator.

The main body sub-frame shall be fully welded to the longitudinal chassis extrusions. Two (2) 6061-T6 aluminum longitudinal extrusions shall be provided, one (1) on each chassis frame rail running full length beneath the apparatus body. A minimum .50" extruded wall thickness shall be provided on the top flange of the chassis frame rail. Each extrusion shall be designed to cover the complete top flange and outside radius of the chassis frame rail extending down the outside web of the frame rail a minimum of 1.25" to prevent side to side shifting of the apparatus body.

The main body sub-frame shall be constructed of not less than four (4) 4.00" by 2.50" tubular, 6061-T6 aluminum, "I" beams with a .375" vertical main body crossmembers. A minimum of four (4) crossmembers shall be provided two ahead of and two behind the rear axle forming the main body support crossmembers.

The main cross tubes shall be routed through and fully welded to the vertical and horizontal extrusions forming the body super-structure.

For added strength and rigidity, no less than six (6) intermediate body crossmembers shall be provided constructed of solid aluminum structural "I" beams 4.00" high by 3.00" wide with a minimum .29" flange thickness. If necessary, additional crossmembers shall be provided, to meet the minimum booster tank mounting requirements, as published by the manufacturer of the booster tank provided.



The intermediate structural "I" beam crossmembers shall be interconnected and welded to the main body tubular crossmembers forming a fully welded support grid for the body super-structure compartments and booster tank.

A minimum of six (6) U-bolts shall be provided to secure the body sub-structure to the chassis frame. The forward two (2) U-bolts shall be shock absorbing spring tension type to allow for flexing without placing stress on the apparatus body or chassis frame rails.

BODY WIDTH

The overall width of the pumper body shall not exceed 100". The overall width across the rub rails shall be 101".

COMPARTMENT DEPTH

All left side upper compartments shall have an interior usable depth of not less than 12" in the upper portion with the specified doors in the closed position.

The lower portion of the front and rear side compartments of the body are to be notched in and under the water tank to a useable depth of 26" with the specified doors in the closed position in order to provide the maximum amount of storage area.

All right side upper compartments shall have an interior usable depth of not less than 12" in the upper portion with the specified doors in the closed position.

The right side lower portion of the forward and rear side compartments of the body are to be notched in and under the water tank to a useable depth of 26" with the specified doors in the closed position in order to provide the maximum amount of storage area.

HINGED COMPARTMENT DOOR CONSTRUCTION

Any compartment calling for a hinged door shall be supplied with a flush style door, so that all hinged compartment doors shall be of the overlapping style so that the entire door fits flush against the apparatus body sides. Doors shall be designed, in the closed position, to have the painted edges protected from damage on the tops by forming the treadplate compartment tops into a extended drip edge, on the bottoms by the rub rail and on the front and rear by extending the front and rear vertical scuff plates into protective edges. There shall be no visible painted door edge surfaces when the doors are in the closed position. Doors shall not extend into the compartments thereby reducing the usable compartment depths.

Doors shall be a minimum 2" thick, fabricated of a minimum of 1/8" smooth aluminum. Full panel inner compartment door liners shall be provided and constructed from smooth aluminum. Exterior door panels shall be smooth with no welds visible on the exterior skin. Double door compartments shall not



require nor be equipped with a secondary latch to hold the same in position.

All compartment door hinges shall be full length piano type constructed of a minimum 14-gauge type 304 polished stainless steel with 1/4" stainless steel hinge pin with dual directional bolt holes for ease of adjustment. Door hinges shall be fully recessed and protected from the environment by the door gasket. The door hinges shall not be visible from the outside of the body when the doors are in the closed position.

Striker plates shall be a minimum of 12-gauge stainless steel and posts shall be positioned so they do not interfere with the clear door openings by pointing down. Door retention studs or posts on striker plates that extend into the clear door frame opening do not meet the technical intent of these specifications and are not acceptable. Door hinges and striker plates shall be attached with minimum 5/16" stainless steel nuts and bolts.

On vertically hinged double door compartments, the secondary door shall have a nylon door holder, top and bottom of the interior of the door to hold the door in place when closed. When specified, horizontally hinged lift-up doors shall be equipped with heavy-duty gas filled dampeners to hold the doors in the open position. All other hinged doors shall be equipped with spring loaded hold open devices specifically designed for use on vertically hinged doors. Door holders shall be bolted in position. The door ajar switches shall be fully enclosed within structural members and shall not extend into the clear door opening.

All hinged compartment doors shall be provided with hollow core weather stripping to provide a weather tight seal at the door opening and to prevent road spray and debris from entering the compartment.

Hinge door openings shall match the compartment sizes. No exception.

EXTERIOR DOOR HANDLES

All compartment doors shall be furnished with a large, keyed, locking Hanson Model #102 solid STAINLESS STEEL spring loaded D-handle with slam type latches. D-handles shall have the large style "bent" D-ring for ease of grabbing the handle even when wearing mitts or gloves. Chrome plated standard steel D-handles are not acceptable.

Door handles shall be held in place with four stainless steel stud fasteners secured on the interior of the door skin to eliminate bolt heads on the exterior latch ring. To prevent possible interaction between dissimilar metals, the studs shall not break any painted surface. A non-moisture absorbing gasket shall be installed between the door latch and the door skin panel.

Handles which are held in place with visible fasteners, two sided tape or glue do not meet the intent of this requirement.



BODY LENGTH

The apparatus body shall be 166" long.

COMPARTMENT HEIGHT

The left side full height body compartments shall be 66" high and equipped with a 66" high clear door opening.

The left side upper level compartment(s) shall be 35" high and equipped with a 35" high clear door opening.

LEFT FRONT COMPARTMENT

There shall be one (1) 44" wide full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height double hinged doors.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

ADJUSTABLE SHELF

Two (2) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelf(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

One shelf shall be fixed and set at the compartment depth split

500# ROLLOUT TRAY

Two (2) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out"



positions.

SLIDE OUT TRAY LOCATIONS, L-1 COMPARTMENT

One (1) tray shall be floor mounted and located to the right of the specified refrigerator. One (1) tray shall be adjustable in the lower 26" depth portion of the compartment above the refrigerator.

REFRIGERATOR 42-42-1260

One (1) Norcold model DE-0740 AC/DC Marine Refrigerator shall be mounted in the forward portion of the front compartment on the Driver's side (L1).

The roll-out tray shall be mounted on tracks to make the tray adjustable.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

Two (2) 54" long Whelen Fluorent™ Plus Model F54PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 540 lumens. The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT OVERWHEEL COMPARTMENT

There shall be one (1) 58" wide compartment above the rear wheels. The compartment shall be equipped with a single hinged lift up door.

The compartment shall be equipped with the following:

>>58" wide compartment - 6" was added to the standard width of this compartment to allow for both a fuel fill and SCBA compartment in the wheel well area behind the rear wheels.

A removable louvered vent shall be provided in the compartment.



ADJUSTABLE SHELF

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

The floor area for upper high side compartment shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

Two (2) 27" long Whelen Fluorent™ Plus Model F27PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 270 lumens. The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT REAR COMPARTMENT

There shall be one (1) 44" wide full height compartment located behind the rear wheels. The compartment shall be equipped with a full height double hinged doors.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.



No Way No How can these vents be in the wheel well area!!

ADJUSTABLE SHELF

Four (4) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

Two (2) shelves shall be located in the upper 12" depth portion and two (2) in the lower 26" depth portion of the compartment.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

FIRE EXTINGUISHER MODULES

Three (3) compartment modules shall be provided for three (3) fire department supplied fire extinguishers. The module, constructed of .188" brushed aluminum shall be installed with a slant from the compartment opening to the rear of the compartment.

The modules shall be located to the right of the transverse portion of the the compartment in the area that extends into the rear step.

Please see pictures in the production files showing modules in the department's existing apparatus.

The floor area for the compartment behind the rear wheels shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

Two (2) 54" long Whelen Fluorent™ Plus Model F54PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 540 lumens.



The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

COMPARTMENT HEIGHT

The right side full height body compartments shall be 66" high and equipped with a 66" high clear door opening.

The right side upper level compartment(s) shall be 35" high and equipped with a 35" high clear door opening.

RIGHT FRONT COMPARTMENT

There shall be one (1) 44" wide full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height double hinged doors.

The compartment shall be equipped with the following:

The right side compartment ahead of the rear wheels shall have compartment provisions as follows:

A removable louvered vent shall be provided in the compartment.

ADJUSTABLE SHELF

Two (2) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

Both shelves shall be mounted in the upper 12" depth portion of the compartment.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.



All turtle tile shall be black in color.

500# ROLLOUT TRAY

Two (2) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

One (1) tray shall be floor mounted and one (1) tray shall be adjustable in the lower 26" depth portion of the compartment.

The roll-out tray shall be mounted on tracks to make the tray adjustable.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

Two (2) 54" long Whelen Fluorent™ Plus Model F54PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 540 lumens. The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT OVERWHEEL COMPARTMENT

There shall be one (1) 58" wide compartment above the rear wheels. The compartment shall be equipped with a single hinged lift up door.

The compartment shall be equipped with the following:

>>58" wide compartment - 6" was added to the standard width of this compartment to allow for both a fuel fill and SCBA compartment in the wheel well area behind the rear wheels.



A removable louvered vent shall be provided in the compartment.

SWING-OUT ALUMINUM TOOL BOARD

One (1) 250 lb. rated capacity fire apparatus swing-out tool board(s) shall be provided. Swing-out tool board(s) shall be provided with 3/16" cadmium plated mounted brackets securely mounted to reinforced mounting points on the apparatus body. Two (2) mounting points shall be on a vertical surface, (1) at the top of the bracket and (1) at the bottom extending approximately 5" from the vertical mounting point. The upper and lower pivot points of the swing-out tool board shall include heavy duty bronze bearings for extended life. Due to the weight of the equipment intended to be carried on the tool board, the mounting points on the apparatus body shall be suitably designed to support the intended weight.

A single latch mechanism shall be provided to lock the tool board in the stored position and in the opened position. The handle shall be an inverted "U" shape for easy access with a gloved hand, painted yellow in color.

The frame of the tool board shall be fabricated of steel tubing welded into a module. Attached to this module shall be a .125" aluminum tool board panel for mounting equipment. Special brackets attached to this tool board shall be provided as listed elsewhere in these specifications.

The floor area for upper high side compartment shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

Two (2) 27" long Whelen Fluorent™ Plus Model F27PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 270 lumens. The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT REAR COMPARTMENT

There shall be one (1) 44" wide full height compartment located behind the rear wheels. The compartment shall be equipped with a full height double hinged doors.



The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

No Way No How can these vents be in the wheel well area!!

ADJUSTABLE SHELF

Three (3) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelf(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

Two (2) shelves shall be located in the upper 12" depth portion of the compartment and one (1) in the lower 26" depth portion.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

500# ROLLOUT TRAY

One (1) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

The slide out tray shall be floor mounted.

The shelf/tray shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

All turtle tile shall be black in color.

Two (2) 54" long Whelen Fluorent™ Plus Model F54PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 540 lumens. The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone



rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

REAR BODY BEAVERTAILS

The rear vertical surface of the body shall be recessed in from the rear edge of the body on each side. The rear body corners shall be square with a recessed step and standing area between the body sides.

REAR CENTER COMPARTMENT

There shall be one (1) full height compartment located at the rear of the apparatus. The compartment shall be equipped with a full height natural finish roll up door. The compartment shall be partitioned off from the side compartments.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

ADJUSTABLE SHELF

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

COMPARTMENT LIGHTS

Two (2) 36" long Whelen Fluorent™ Plus Model F36PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 360 lumens. The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.



The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

REAR STEP - 12" RECESSED

A 12" deep step shall be provided at the rear of the apparatus body, recessed in place and easily removable for replacement or repair. The tailboard shall be constructed of .188" aluminum diamond plate or equal non-slip surface in compliance with NFPA #1901 standards.

The maximum height of the step assembly shall be no more than 24" from the ground when the apparatus is in the loaded condition. A label shall be provided warning personnel that riding on the rear step while the apparatus is in motion is prohibited.

The back of the truck shall be a true recess square back. The usable step surface MUST be 12". There shall be NO rear bumper or tailboard besides the 12" recess.

WHEEL WELL COMPARTMENT LEFT SIDE AHEAD OF WHEELS

One (1) wheel well compartment shall be located on the left side in the rear wheel well panel ahead of the rear wheels of the type specified herein.

One (1) Fire Shopp Inc. breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

WHEEL WELL COMPARTMENT LEFT SIDE BEHIND WHEELS

One (1) wheel well compartment shall be located on the left side in the rear wheel well panel behind the rear wheels of the type specified herein.



FUEL FILL DOOR

A Fire Shopp Inc. fuel fill access assembly shall be provided on the left side rear wheel well area. The assembly shall include a brushed stainless steel fuel fill enclosure door and a black polymer fuel assembly. A label indicating DIESEL FUEL ONLY shall be applied.

Fuel fill door must be separate from SCBA door.

One (1) Fire Shopp Inc. breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

WHEEL WELL COMPARTMENT RIGHT SIDE AHEAD OF WHEELS

One (1) wheel well compartment shall be located on the right side in the rear wheel well panel ahead of the rear wheels of the type specified herein.

One (1) Fire Shopp Inc. breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop



over the valve.

WHEEL WELL COMPARTMENT RIGHT SIDE BEHIND WHEELS

One (1) wheel well compartment shall be located on the right side in the rear wheel well panel behind the rear wheels of the type specified herein.

FUEL FILL DOOR

A Fire Shopp Inc fuel fill access assembly shall be provided on the right side rear wheel well area. The assembly shall include a brushed stainless steel fuel fill enclosure door and a black polymer fuel assembly. A label indicating DIESEL FUEL ONLY shall be applied.

Fuel fill door must be separate from SCBA door.

One (1) Fire Shopp Inc. breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

The compartments shall hold SCBA bottles with the dimensions of 7.00" dia. x 25.75" long.

SLIDE OUT VERTICAL LADDER COMPARTMENT

The ground ladders shall slide into a compartment at the right rear of the apparatus beside the tank and below the hosebed. The vertically mounted slide in assembly shall be an integral part of the body and accessible through a hinged door.

LADDER SOURCE

New ground ladders shall be provided by the purchaser.



ROOF LADDER

One (1) Alco-Lite Model PRL-14, 14-foot aluminum roof ladder with folding steel roof hooks on one end and rubber safety shoes on the other end shall be provided by the Dealer/Purchaser/Fire Department on the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

EXTENSION LADDER

One (1) Alco-Lite PEL-24, 24 foot two (2) section aluminum extension ladder shall be provided Dealer/Purchaser/Fire Department on the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

FOLDING ATTIC LADDER MOUNTING

A mounting in the ground ladder storage shall be provided for the specified folding attic ladder.

FOLDING ATTIC LADDER SOURCE

New folding attic ladders shall be provided by the Dealer.

FOLDING ATTIC LADDER

One (1) Alco-Lite Model FL-10, 10-foot folding aluminum attic ladder shall be provided by the Dealer/Purchaser/Fire Department. The ladder shall meet or exceed all the latest NFPA Standards.

PIKE POLE MOUNTING BRACKET

Three (3) tube shall be provided for pike pole mounting. The tube shall have a 2-1/4" interior diameter and shall be mounted within the ladder compartment.

PIKE POLE SOURCE

All pike poles shall be provided by the purchaser.

PIKE POLE

One (1) 8' pike pole with round handle shall be provided by the Dealer/Purchaser/Fire Department. The pike pole shall be of fiberglass construction.

PIKE POLE

Three (3) 10' pike pole with round handle shall be provided by the Dealer/Purchaser/Fire Department. The pike pole shall be of fiberglass construction.



FOLDING STEPS LEFT SIDE FRONT

Three (3) folding steps of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a LED light mounted above the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the left side front compartment face.

FOLDING STEPS RIGHT SIDE FRONT

Three (3) folding steps of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a LED light mounted above the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the right side front compartment face.

FRONT BODY PROTECTION PANELS

Aluminum tread plate overlays and panels shall be installed on the front of the body from the lower edge to the top of the compartment doors. The material shall be bolted in place and sealed to prevent any moisture entry between the overlay and the body structure.

REAR BODY PROTECTION PANELS

Smooth aluminum shall be installed on the rear of the body, to allow for the installation of a "Chevron" stripe on the rear.

FUEL TANK ACCESS PANEL

There shall be a removable panel in the rear compartment, used to gain access to the fuel tank and fuel gauge-sending unit.



FOLDING STEPS LEFT SIDE REAR

Three (3) folding steps of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a LED light mounted above the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The steps shall be installed on the rear left side of the body.

FOLDING STEP RIGHT SIDE REAR

A folding step of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a LED light mounted above the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the rear right side of the body.

I-ZONE BRACKETS

Two (2) CDF/Cal Fire style I-Zone brackets (Interface Hooks) shall be provided at the rear of the body, one each side. The brackets shall consist of a cast aluminum receiver, stainless steel clevis pin and spring clamp, and approximately 14" of round stainless steel tubing bent to approximately 45 degrees in the center enabling it to retain the loaded fire hose.

The locations for the I-zone brackets will be in the rear face mounted to the 2x3 structure at the same height as the cat walks

HANDRAIL REAR STEP

Two (2) extruded aluminum non-slip handrails, approximately 48" in length, shall be provided and vertically mounted on the rear of the apparatus, one (1) on each side of the body.



HANDRAIL BELOW HOSEBED

One (1) extruded aluminum non-slip handrail, approximately 60" in length, shall be provided and horizontally mounted below the hosebed on the rear of the apparatus.

HANDRAIL TOP OF BODY SIDES

Two (2) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and mounted, one (1) each side at the top of the body sides, at the rear of the apparatus body.

Please mount one (1) per side front of body to the top of the catwalks.

EXTRUDED ALUMINUM RUB RAILS

Full body length polished aluminum rub rails shall be bolted in place on the lower right and left body sides. The side rub rails shall be a heavy extruded aluminum "C" channel. There shall also be a bolt on aluminum corner casting on each rear corner to blend the rear tail board assembly with the side rub rails.



APPARATUS 12 VOLT ELECTRICAL SPECIFICATIONS

GREEN STAR IDLE REDUCTION TECHNOLOGY (IRT)

A Green Star idle reduction technology system shall be supplied with the apparatus that will significantly reduce the amount of diesel exhaust soot, NOx and CO2 emissions into the atmosphere. Diesel engines contain pollutants that negatively impact human health and the environment. Diesel engines emit large amounts of nitrogen oxides, particulate matter and air toxics, which contribute to serious public health problems. Idle reduction technology has been verified by the U.S. EPA to reduce diesel emissions from diesel powered vehicles and engines.

The Green Star IRT will reduce idle time through the use of an auxiliary power unit (APU) in conjunction with automatic diesel engine controls that will shut down the main chassis diesel engine during operations not requiring the use of the pump assembly. This system will be automated and will not require intervention from the vehicle operator. There will be a time delay engine shut down feature that will automatically shut down the chassis main diesel engine and engage the diesel driven APU. This feature will be available when the chassis air brake is set and when the pump assembly is not engaged.

All features below are available with the main chassis diesel engine off.

The chassis voltage system is protected against extreme drain of the battery bank. If the vehicles voltage drops to 12 VDC, the automatic engine controls will start the chassis diesel engine to provide a charge.

Reducing the amount of idle time for the chassis diesel engine will substantially reduce the fuel consumption.

There shall not be a Greenstar defeat or override switch.

GREEN STAR BATTERY MOUNTING LOCATION

The two (2) batteries used for the greanstar system shall be housed in the pump compartment.

The Green Star system shall be mounted to the full length shelf added to the overhead pump module. They shall be mounted in such a way as that they will minimize impact on shelf space but still be serviceable in the future.

GREEN STAR AUXILIARY BATTERY PACK

The unit shall be equipped with an auxiliary battery pack to allow greater fuel savings by delaying startup of the Auxiliary Power Unit after chassis engine shutdown. The system will automatically start the APU if ABP voltage drops below 11.5V.



The (2) auxiliary battery pack batteries shall be rated at 100 Amp-Hours, each. The auxiliary battery pack shall be completely sealed and ideally suited to being discharged and recharged repeatedly. The auxiliary battery pack shall be capable of being mounted & operated in any position. This energy storage solution provides the most reliable, economical and maintenance free solution for this application.

An hour meter shall be located on the pump panel area and shall indicate total hours of Idle Reduction (IR) time. The hour meter shall only run during IR.

The auxiliary battery pack will power all 12 volt functions related to the body including but not limited to Compartment Lighting, Warning Lighting, and Ground Lighting.

An hour meter shall be located on the pump panel area and shall indicate total hours of Idle Reduction (IR) time. The hour meter shall only run during IR.

BATTERY CHARGER

The specified Kussmaul battery charger will be used to charge the auxiliary battery pack.

The chassis supplied charge indicator is to be located above the cab side marker light in the 217DS

The Shoreline Auto Eject is to be located on the most forward section of the lower drivers step inboard wall.

BATTERY ISOLATOR

One (1) Sur Power 952 Multi-Battery isolator shall be provided and installed to isolate the chassis batteries from the Green Star battery system.

REFRIGERATOR

One (1) Norcold model NR740BB-H AC/DC Marine Refrigerator shall be mounted in the driver's side front compartment.

The refrigerator will automatically switch from AC to DC power when required. The size of the refrigerator is 20-1/2"H x 15-1/4"W x 17-3/4" D.

The refrigerator shall be wired to operate in the AC mode when the 120 volt shoreline is connected and in the 12 volt DC mode when not connected to the shoreline. The 12 volt DC mode shall be wired to the ignition side of the electrical system.

The Norcold DE-0470 is to be mounted in the driver's side EMS compartment

NOTE: Verify with engineering that this will fit. (precon) 5.20.16 tjm



120V ELECTRIC RECEPTACLE -- STRAIGHT BLADE

One (1) single 120-volt 15 amp straight blade, 3-prong receptacle with spring loaded weatherproof cover shall be provided.



APPARATUS PAINT STRIPPING AND LETTERING SPECIFICATIONS

BODY PAINT PROCESS

While constructing the truck body, all aluminum parts that are to be finish painted shall be properly fitted on the body and then removed to be painted individually. The back side of all aluminum parts shall be sanded smooth of any burrs and sharp edges.

During reassembly of the apparatus, care shall be exercised in fitting and fastening the parts back in their respective position on the vehicle.

All aluminum parts shall be bolted to the body using stainless steel fasteners. Zinc or Cadmium plated fasteners are not acceptable. All bright metal fittings, if unavailable in stainless steel shall be heavily chrome plated. Iron fittings shall be copper plated prior to chrome plating.

All seam shall be caulked both inside and along the exterior edges with a urethane automotive sealant to prevent moisture from entering between any body panels.

The body and all parts shall be thoroughly washed with a grease cutting solvent (PPG DX330) prior to any sanding. After the body has been sanded and the weld marks and minor imperfections are filled and sanded, the body shall be washed again with (PPG DX330) to remove any contaminants on the surface.

A coating of epoxy sealer (PPG DP 48/50/90) shall be applied with a minimum of 1.0 to 2.0 mil dry film build. The epoxy sealer allows for maximum adhesion to the body material. A color coating of PPG Urethane Paint Direct Gloss with PPG Catalyst shall be applied with a minimum of 2.0 to 3.0 mil dry film build. The catalyst provides a base level UV barrier to prevent fading and chalking. A coating of PPG Clearcoat Topcoat Urethane with a minimum of 2.0 to 3.0 mil dry film build. shall be applied. The clearcoat topcoat provides a maximum amount of UV barrier protection.

All products and technicians are certified by PPG every two (2) years.

INTERIOR COMPARTMENT FINISH

The interior of the eight (8) compartments shall be unpainted and have a D/A orbital sander finish.

TOUCH-UP PAINT

Two (2) two (2) ounce bottles of touch-up paint (one for each color) shall be furnished with the completed truck at final delivery.



UNDERCOATING

The entire underside of the single axle apparatus body is to be cleaned and properly prepared for application of a sprayed on automotive type undercoating for added corrosion resistance. Undercoating is to be a solvent based, rubberized coating, black in color.

SCOTCHLITE REFLECTIVE LETTERING

The lettering shall be applied with Scotchlite reflective material, shaded in black.

A quantity of seventy-five (75), four (4) inch letters are to be placed on the cab and on the body as directed by fire department.

All lettering is to be 3M 680 series reflective vinyl Gold #680-64.

- * No lettering shall be required at the front of the cab.
- * The specified FD supplied decal shall be installed on the driver and officer door.
- * The rear most door on the L3 and R3 compartments above the specified stripping to state:

EMERGENCY
DIAL 911

- *The rear most door on the L3 and R3 compartments below the specified stripping to state

E.M.T.
ADVANCED

Exact lettering and locations and sizes shall be approved at the mid-point construction conference.

SCOTCHLITE REFLECTIVE LETTERING

The lettering shall be applied with Scotchlite reflective material, shaded in black.

A quantity of fifty (50) letters are to be placed on the cab and on the body as directed by fire department. The letters shall be between eight and twelve inches in height.

The lettering located above the compartment doors on the header is to be 3M 680 series reflective vinyl Gold #680-64.

The lettering shall state: 'SPARKS FIRE / RESCUE' on each side.

The lettering located on the rear compartment door shall be 3M 680 series reflective vinyl Red.

The lettering shall state: 'KEEP BACK 343 FEET'.



CAB ROOF LETTERING

Lettering stating "SPARKS" shall be provided on the raised roof portion of the cab in black mylar and as large as space permits.

Lettering stating "SPARKS" shall be provided on the raised roof portion of the cab in black mylar and as large as space permits.

Location shall be side to side on the raised portion of the roof.

INSTALL CUSTOMER SUPPLIED DECALS

Factory installation of the purchaser supplied decals shall be provided as specified.

AMERICAN FLAG

An American Flag shall be located on the rear compartment roll up door.

An American Flag shall be located on the rear compartment roll up door.

REFLECTIVE STRIPING

A 1" x 5" x 1" wide 3M brand Scotchlite reflective multi-stripe shall be affixed to the perimeter of the vehicle. There shall be a 1" gap between each of the stripes. Striping shall conform to applicable NFPA requirements. At least 50% of the perimeter length of each side and width of the rear, and at least 25% of the perimeter width of the front of the vehicle shall have reflective striping.

>> 1" x 5" x 1"

COLOR OF STRIPING MATERIAL

The color of the 1" 3M brand striping material shall be Gold #680-64 and the 6" material shall be White #680-10.

>> 1" material = Gold #680-64

>> 6" material = White #680-10

CHEVRON STRIPING

The front bumper shall have 3M reflective red and white striping installed. The chevron style striping shall be applied at a 45-degree upward angle.

The striping shall be 3M brand and be the following part numbers:



Red: 983-72NL ES
White

CHEVRON STRIPING

The entire rear portion of the body shall have 3M reflective red and white striping installed. The chevron style striping shall be applied at a 45-degree upward angle pointing towards the center upper portion of the rear panel.

The rear roll up door shall not have striping.

The striping shall be 3M brand and be the following part numbers:

Red: 983-72NL ES
White

CAB DOOR REFLECTIVE TRIM

Cab door reflective trim NFPA compliant reflective red/lime green in accordance with NFPA 14.1.6.

The striping shall be in a Chevron pattern, 3M brand and be the following part numbers:

Red: 983-72NL ES
Yellow/Green: 983-23 ES>>Red & White - see previous units.

TRUCK NUMBER FRAME

A 10" x 10" frame shall be installed on the truck that can hold a truck number sign. The frame shall be flip up style so that the number sign can be easily removed or replaced. The frame shall be painted to match the exterior of the truck where it will be mounted.

The locations of the identifications plates shall be:

- One center of the front bumper.
- One on mounted on each side of the cab one inch above the paint brake line on the ems doors.
- One on the drivers side rear face down low as indicated on the sales drawing.

TRUCK NUMBER SIGN

A truck number sign plate shall be provided for the truck number frame.

The numbers indicated on the plates are to be "11" for 13879 and "12" for 13880, The numbers will be white reflective with black boarder sized to f



APPARATUS EQUIPMENT SPECIFICATIONS

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA #1901 standards, the apparatus shall be engineered to provide an allowance of 2500 pounds of fire department provided loose equipment.

WHEEL CHOCKS WITH MOUNTS

A pair of Zico Model SAC-44 Quic-Chok folding wheel chocks shall be provided and mounted under the apparatus body with model SQCH-44H horizontal mounting brackets.

The wheel chocks shall be mounted in front of and behind the rear wheels on the driver's side.

MOUNTING CLAMP

Twenty (20) Performance Advantage Handlelok model #1004 fast-locking, adjustable and instant release clamp shall be provided. Handlelok is compliant with the NFPA 1901, 9G mounting requirement at a rated load of 10 pounds.

The base (#4015) shall be black injection-molded of super tough Nylon with high-strength glass fibers. A high visibility yellow or black Stretchlok (#4013) strap having a tensile strength at breakpoint of 5400 PSI shall be provided. The unit utilizes stainless steel pins and an injection molded nylon handle pin is resistant to weather, oxidation, and deterioration. An adhesive-backed, open-cell neoprene soft pad (#4029) that adheres to the base shall provide additional grip. The radiused top edge of the base is designed to prevent mounted items from rolling off prior to engaging the Griplok.

The 2-3/4" high x 4" wide x 1-7/8" deep bracket shall be UV-stabilized and non-conducting. The mounting shall be adjustable to provide a secure mounting for tools, axe handles, poles and other equipment. The grip range shall be 1/8" to 1-3/4" for automatic adjustment. Stainless steel fasteners (#2032) shall be provided for horizontal or vertical mounting.

MISCELLANEOUS HARDWARE

Miscellaneous loose hardware consisting of bolts, nuts, washers, and screws shall be supplied with the apparatus at time of delivery.

ROAD SAFETY KIT

One (1) 2-1/2# ABC DOT Approved fire extinguisher shall be provided. The fire extinguisher shall be shipped loose with the chassis.



One (1) set of DOT approved hazard triangles shall be supplied with the chassis. They shall be stored in a plastic case and shipped loose with the chassis.

One (1) first aid kit.



APPARATUS WARRANTY AND MANUALS SPECIFICATIONS

PAINT WARRANTY TEN YEAR

The PPG paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of TEN (10) years beginning the day the vehicle is delivered to the purchaser.

The full apparatus chassis, manufactured and painted by Rosenbauer Motors, LLC, shall be covered for the following paint failures as outlined on the guarantee certificate:

- Peeling or delaminating of the topcoat and/or other layers of paint.
- Cracking or checking.
- Loss of gloss caused by cracking, checking, or hazing.
- Any paint failure caused by defective PPG Fleet Finishes, which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original purchaser.

Note: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

CAB STRUCTURE WARRANTY

The cab structure shall be warranted for a period of ten (10) years with the complete detail of the warranty outlined in a document provided upon request.

TRANSMISSION WARRANTY

The Allison EVS transmission shall be warranted for a period of five (5) years with the complete detail of the warranty outlined in a document provided upon request.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever comes first, with the complete detail of the warranty outlined in a document provided upon request.

FRAME WARRANTY

The frame and cross members shall carry a lifetime warranty with the complete detail of the warranty outlined in a document provided upon request.



FRONT AND REAR AXLE WARRANTY

The front and rear axles shall be warranted by Meritor for two (2) years with unlimited miles under the general service application.

CAB AND CHASSIS WARRANTY

The cab and chassis shall carry a twenty-four (24) month warranty providing limited parts and labor from the date the complete apparatus is delivered to the end user. The complete detail of the warranty shall be outlined in a document provided upon request.

STATIC LOAD SEAT TEST INFORMATION

This model of seat shall have successfully completed the static load tests set forth 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 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.

CAB TEST INFORMATION

The cab as built shall have successfully completed the pre-load 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 shall have been witnessed by and attested to by an independent third party. The test results shall have been recorded using cameras, high speed imagers, accelerometers and strain gauges.

Documentation of the testing shall be provided upon request.



CAB INTEGRITY CERTIFICATION

The manufacturer shall provide a cab crash test certification with this proposal including SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading for Heavy Trucks and SAE J2420 COE Frontal Strength Evaluation - Dynamic Load for Heavy Trucks.

CAB TEST INFORMATION

Roof Crush

The cab shall be subjected to a roof crush test of 120,000 pounds exceeding the requirements of ECE 29 criteria. The 120,000 requirement is important to ensure to most structurally sound and safe cab in the event of a crash or roll over.

Side Impact

The cab shall be subjected to dynamic moving barrier slammed into the side of the cab at 7.5 mph, striking with an impact of 15,157 foot pounds of energy. This test will closely represent the forces a cab would incur in a rollover incident.

Frontal Impact

The cab shall withstand a frontal force produced from a moving barrier slammed into the front of the cab traveling at 10.5 mph, striking with an impact of 42,587 foot pounds of energy.

The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.

OPERATION AND PARTS LIST MANUALS

Each cab and chassis shall include two (2) digital and one (1) printed copy of the operation manuals and parts listings. The manuals shall include information specific to the components included on the apparatus.

ENGINE AND TRANSMISSION MANUALS

One (1) paper copy of the specific engine and transmission manuals shall accompany each cab and chassis.

ENGINE SERVICE MANUALS

One (1) printed copy of the Cummins engine service manual shall accompany the cab and chassis.



TRANSMISSION SERVICE MANUALS

Each cab and chassis shall include one (1) printed copy of the service manual for the Allison brand transmission.

AS BUILT WIRING DIAGRAMS

Each cab and chassis shall include one (1) digital copy of the wiring schematics and component wiring. The wiring schematics shall be developed on a software program such as VeSys Design or equal that provides continuity in files and diagram. The software shall allow you to trace through the design schematics to identify cross referenced items such as in-line connectors and wires. The software shall be interactive which allows you to view one electrical assembly drawing, click on a wire routing and the program will take you to the related circuit assembly or termination point. The software shall also provide a searchable function allowing you to view multiple diagrams using readily available pdf viewers. The digital copy of the wiring schematics shall be compatible with hand held devices such as I-Pads.

USB STORAGE

For ease of service the chassis shall come with an on board USB flash drive. The flash drive shall have a minimum of 8 GB of storage capacity; and shall be located behind the access panel on the driver side kick panel, next to the data port for the engine.

The following items shall be stored on the Flash Drive. No Exception.

- As built wiring diagrams
- Plumbing diagram
- Chassis and body manuals

The USB shall be accessible through a USB-A to USB-B cable.

BUMPER TO BUMPER WARRANTY

We warrant each new motorized fire apparatus manufactured by ROSENBAUER AMERICA, LLC for a period of ONE YEAR from the date of delivery, except for chassis and other components noted herein.

Under this warranty we agree to furnish any parts to replace those that have failed due to defective material or workmanship where there is no indication of abuse, neglect, unusual or other than normal service providing that such parts are, at the option of ROSENBAUER AMERICA, LLC, made available for our inspection at our request, returned to our factory or other location designated by us with



transportation prepaid within thirty days after the date of failure or within one year from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to defective material or workmanship.

The warranty on the chassis and chassis supplied components, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the manufacturer by the customer.

This warranty will not apply to any fire apparatus that has been repaired or altered outside our factory in any way, which in our opinion might affect its stability or reliability.

This warranty shall not apply to those items that are usually considered normal maintenance and upkeep services: including, but not limited to, normal lubrication or proper adjustment of minor auxiliary pumps or reels.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability in connection with the sales of our apparatus unless made in writing by ROSENBAUER AMERICA, LLC.

EXT MODULAR BODY WARRANTY - LIFE-TIME

Rosenbauer America, LLC warrants to the original purchaser that the all aluminum body, fabricated by Rosenbauer America, LLC, under normal use and with reasonable maintenance, be structurally sound and will retain structural integrity for the life of the vehicle. Warranty coverage is transferable to second owner, if applicable, with proper notification made to Rosenbauer America, LLC.

This warranty does not apply to the following items that are covered by a separate warranty: paint finish, hardware, moldings, and other accessories attached to this body. In addition, this warranty does not apply to any part or accessory manufactured by others and attached to this body.

ROSENBAUER AMERICA, LLC MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE ALUMINUM BODY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND HEREBY DISCLAIMED.

Rosenbauer America, LLC will replace without charge, repair or make a fair allowance for any defect in material or workmanship demonstrated to its satisfaction to have existed at the time of delivery or not due to misuse, negligence, or accident. If Rosenbauer America, LLC elects to repair this body, the extent of such repair shall be determined solely by Rosenbauer America, LLC, and shall be performed solely at the Rosenbauer America, LLC factory, or at an approved facility. The expense of any transportation to or from such repair facility shall be borne by the purchaser and is not an item covered under this warranty.



Rosenbauer America, LLC will not be liable for damages and under no circumstances will its liability exceed the price for a defective body. The remedies set forth herein are exclusive and in substitution for all other remedies to which the purchaser would otherwise be entitled.

Rosenbauer America, LLC will be given a reasonable opportunity to investigate all claims. The purchaser must commence any action arising out of, based upon or relating to agreement or the breach hereof, within twelve months from the date the cause of the action occurred.

Note: Surety bond, if required, will cover standard one-year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

ALUMINUM SUBFRAME WARRANTY

Subject to the provisions, limitations and conditions set forth in this warranty, Rosenbauer America, LLC (hereby referred to as "seller"), hereby warrants to each original purchaser that each new aluminum body subframe (exclusive of paint finish and hardware) is structurally sound and free of all structural defects of both material and workmanship and further warrants that it will maintain such structural integrity for the lifetime of the body. Warranty coverage is transferable to second owner, if applicable, with proper notification made to Rosenbauer America, LLC.

This warranty is conditioned upon normal use and reasonable maintenance of such subframe; prompt written notice of all defects to seller or one of the seller's then authorized dealers in the area; no repair or additions there to except by seller or authorized by it; said defect not resulting from misuse, negligence, accident, remount, overloading beyond applicable weight rating by customer or third parties. If any such conditions are not complied with, this warranty shall become void and unenforceable.

Should repairs become necessary under the terms or the warranty, the extent of that repair shall be determined solely by the seller and shall be performed solely at Rosenbauer America, LLC or a repair facility designated by the seller. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.

Seller reserves the unrestricted right at any time from time to time to make changes in the design of and/or improvements on its products without thereby imposing any obligation on itself to make corresponding changes or improvements in or on its products theretofore manufactured.

EXCLUSIONS AND LIMITATIONS: THIS MANUFACTURER'S WARRANTY IS PROVIDED IN PLACE OF ANY AND ALL OTHER REPRESENTATIONS OR IMPLIED WARRANTIES. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTY ON BEHALF OF ROSENBAUER AMERICA, LLC OR ANY OF ITS DISTRIBUTORS OTHER THAN SET FORTH IN THIS MANUFACTURER'S WARRANTY. YOUR RIGHT TO SERVICE AND REPLACEMENT OF PARTS ON THE TERMS EXPRESSLY SET FORTH HERIN ARE YOUR EXCLUSIVE REMEDIES AND NEITHER THE MANUFACTURER NOR ANY OF ITS



DISTRIBUTORS SHALL BE LIABLE FOR DAMAGES, WHETHER ORDINARY, INCIDENTAL OR CONSEQUENTIAL.

Note: Surety bond, if required, will cover standard one-year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

PAINT WARRANTY TEN YEAR

The PPG paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of TEN (10) years beginning the day the vehicle is delivered to the purchaser.

The full apparatus body, manufactured and painted by Rosenbauer America, LLC, shall be covered for the following paint failures as outlined on the guarantee certificate:

- Peeling or delaminating of the topcoat and/or other layers of paint.
- Cracking or checking.
- Loss of gloss caused by cracking, checking, or hazing.
- Any paint failure caused by defective PPG Fleet Finishes, which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original purchaser.

Note: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

LETTERING WARRANTY

Rosenbauer America, LLC warrants to the original purchaser only, that the lettering and striping, installed by Rosenbauer America, LLC, will remain free from defects for a period of one (1) year under normal use.

Rosenbauer America, LLC will replace without charge, repair or make a fair allowance for any defect in material or workmanship demonstrated to its satisfaction to have existed at the time of delivery or not due to misuse, negligence, or accident. If Rosenbauer America, LLC elects to repair this item, the extent of such repair shall be determined solely by Rosenbauer America, LLC, and shall be performed solely at the Rosenbauer America, LLC factory, or at an approved facility. The expense of any transportation to or from such repair facility shall be borne by the purchaser and is not an item covered under this warranty.

FIRE PUMP WARRANTY

EXPRESS WARRANTY: Hale Products, Incorporated (“Hale”) hereby warrants to the original buyer



that products manufactured by Hale are free of defects in material and workmanship for a period of five (5) years from the date the product is first placed into service or five and one-half (5-1/2) years from date of shipment by Hale, whichever period shall be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

LIMITATIONS: HALE'S obligation is expressly conditioned on the Product being:

- Subjected to normal use and service.
- Properly installed and maintained in accordance with HALE'S Instruction Manual and Industry Standards as to recommended service and procedures.
- Not damaged due to abuse, misuse, negligence or accidental causes.
- Not altered, modified, serviced (non-routine) or repaired other than by an Authorized Service facility.
- Manufactured per design and specifications submitted by the original buyer.
- Used with an appropriate engine as determined by the engine manufacturers published data.
- Excluded are normal wear items identified as but not limited to packing, strainers, anodes, filters, light bulbs, intake screens, wear rings, mechanical seals, etc.

THE ABOVE EXPRESS LIMITED WARRANTY IS EXCLUSIVE. NO OTHER EXPRESS WARRANTIES ARE MADE. SPECIFICALLY EXCLUDED ARE ANY IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATIONS, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE; COURSE OF DEALING; USAGE OF TRADE; OR PATENT INFRINGEMENT FOR A PRODUCT MANUFACTURED TO ORIGINAL BUYER'S DESIGN AND SPECIFICATIONS.

EXCLUSIVE REMEDIES: If Buyer promptly notifies HALE upon discovery of any such defect (within the Warranty Period), the following terms shall apply:

- Any notice to HALE must be in writing, identifying the Product (or component) claimed defective and circumstances surrounding its failure.
- HALE reserves the right to physically inspect the Product and require Buyer to return same to HALE'S plant or Authorized service Facility.
- In such event, Buyer must notify HALE for a Return Goods Authorization number and Buyer must return the Product F.O.B. within (30) days thereof.
- If determined defective, HALE shall, at its option, repair or replace the Product, or refund the purchase price (less allowance for depreciation).
- HALE's reimbursement covers only the standard labor and Hale components required for the removal, repair, and/or re-installation of HALE supplied Product.
- HALE's reimbursement does not cover the standard labor or components for the removal and reinstallation of non-HALE supplied components.
- Absent proper notice within the Warranty Period, HALE shall have no further liability or obligation to Buyer there-fore.



THE REMEDIES PROVIDED ARE THE SOLE AND EXCLUSIVE REMEDIES AVAILABLE. IN NO EVENT SHALL HALE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING, WITHOUT LIMITATION, LOSS OF LIFE; PERSONAL INUURY; DAMAGE TO REAL OR PERSONAL PROPERTY DUE TO WATER OR FIRE; TRADE OR OTHER COMMERICAL LOSSES ARISING, DIRECTLY OR INDIRECTLY OUT OF PRODUCT FAILURE.

STAINLESS STEEL PLUMBING WARRANTY

Subject to the provisions, limitations and conditions set forth in this warranty, Rosenbauer America, LLC (hereby referred to as "seller"), hereby warrants to each original purchaser only that stainless steel plumbing components and ancillary brass fittings used in the construction of the water/foam plumbing system shall be warranted for a period of ten (10) years. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten years from the date of the delivery and shall terminate upon the transfer of possession or ownership by original purchaser.

This warranty is conditioned upon normal use and reasonable maintenance of such plumbing; prompt written notice of all defects to seller or one of the seller's then authorized dealers in the area; no repair or additions there to except by seller or authorized by it; said defect not resulting from misuse, negligence, accident, remount, overloading beyond applicable weight rating by customer or third parties. If any such conditions are not complied with, this warranty shall become void and unenforceable.

Should repairs become necessary under the terms or the warranty, the extent of that repair shall be determined solely by the seller and shall be performed solely at Rosenbauer America, LLC or a repair facility designated by the seller. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.

Seller reserves the unrestricted right at any time from time to time to make changes in the design of and/or improvements on its products without thereby imposing any obligation on itself to make corresponding changes or improvements in or on its products theretofore manufactured.

EXCLUSIONS AND LIMITATIONS: THIS MANUFACTURER'S WARRANTY IS PROVIDED IN PLACE OF ANY AND ALL OTHER REPRESENTATIONS OR IMPLIED WARRANTIES. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTY ON BEHALF OF ROSENBAUER AMERICA, LLC OR ANY OF ITS DISTRIBUTORS OTHER THAN SET FORTH IN THIS MANUFACTURER'S WARRANTY. YOUR RIGHT TO SERVICE AND REPLACEMENT OF PARTS ON THE TERMS EXPRESSLY SET FORTH HERIN ARE YOUR EXCLUSIVE REMEDIES AND NEITHER THE MANUFACTURER NOR ANY OF ITS DISTRIBUTORS SHALL BE LIABLE FOR DAMAGES, WHETHER ORDINARY, INCIDENTAL OR CONSEQUENTIAL.



WATER TANK WARRANTY

The tank manufacturer warrants each tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle (vehicle must be actively used in fire suppression). The tank must be installed in accordance with the manufacturer's installation manual. Every tank is thoroughly inspected and tested for leaks before leaving our facility. Should any problems develop with your booster/foam tank and will not meet performance criteria during the service life of the vehicle, notify the tank manufacturer in writing or call our TOLL FREE SERVICE HOT LINE. Provide the manufacturer with the serial number and a description of the problem. If the tank problem would render the truck out of service, the tank manufacturer will dispatch a service technician WITHIN 48 HOURS (2 DAYS) to repair the tank. (This time period is for North America only)

We will repair, or at our option, replace the tank with a new tank. The tank manufacturer will cover customary and reasonable costs to remove and install the tank. This warranty will not cover tanks that have been improperly installed, misused or abused, and the serial number must not have, been altered, defaced or removed. The tank manufacturer will not cover any unauthorized third party repairs or alterations. Any of these actions may void the warranty.

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. ADDITIONALLY, THIS WARRANTY IS IN LIEU OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF THE TANK MANUFACTURER.

This warranty contains the entire warranty. It is the sole warranty and price agreements or representation, whether oral or written, are either merged herein or expressly cancelled. The tank manufacture neither assumes, nor authorizes any person supposing to act on its behalf, to change, nor assume for it, any warranty or liability concerning its product.

IN NO EVENT WILL THE TANK MANUFACTURER BE LIABLE FOR AN AMOUNT IN EXCESS OF THE PRESENT RETAIL, PURCHASE PRICE PLUS INSTALLATION AND REMOVAL COST OF THE BOOSTER TANK, FOR ANY LOSS OR DAMAGE, WHETHER DIRECT OR INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHERWISE ARISING OUT OF FAILURE OF ITS PRODUCT.

This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Some states do not allow exclusion or limitation of incidental or consequential damage, so the above limitation or exclusion may not apply to you. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

COMPLETE COMPACT DISC MANUAL

ROSENBAUER shall provide with the vehicle upon delivery, one (1) complete delivery manual. This manual shall be on a computer generated compact disc (CD), with reference guide for each section of



the vehicle. Within each section shall be:

- Individual component manufacturer instruction and parts manual
- Warranty forms for body
- Warranty forms for all major components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instructions and drawings of major parts
- Visual graphics and electronic photos of the installations of major parts
- Necessary normal routine service forms, publications and components of body portion of apparatus
- Technical publications on training and instructions for major body components
- Warning and safety related notices for personnel protection

Cab and chassis manuals on parts, service and maintenance shall be provided

ELECTRICAL SYSTEM PRINTED MANUAL (OPTION)

ROSENBAUER shall provide with the vehicle upon delivery, one (1) delivery manual for the electrical system. This manual shall be in a notebook type binder, with reference tabs for each section of the vehicle. A companion compact disk (CD) with all of the printed material in an electronic format (Adobe Acrobat PDF) shall be provided.

Within each section shall be:

- Individual component manufacturer instruction and parts manuals
- Warranty forms for the components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instruction and drawings for major parts
- Visual graphics and electronic photos for the installation of major parts
- Necessary normal routine service forms, publications and components for the installed electrical components
- Technical publications for training and instruction on major components
- Warning and safety related notices for personnel protection

Cab and chassis manuals on parts, service and maintenance shall be provided