PURCHASE AGREEMENT
BETWEEN SEAGRAVE
FIRE APPARATUS, LLC
AND THE CITY OF
REDONDO BEACH

THIS PURCHASE AGREEMENT ("Agreement") is made by and between **Seagrave Fire Apparatus, LLC** of Clintonville, Wisconsin, hereinafter referred to as the "Seller", and the **City of Redondo Beach, a municipal corporation** hereinafter referred to as the "Purchaser".

1. The Seller hereby agrees to furnish **one (1) unit of Seagrave model DB50CT Capitol Pumper,** hereinafter referred to as "Apparatus and Equipment", according to the mutually agreed specifications and drawings which are attached hereto and incorporated herein by this reference as Exhibit A and to deliver the same as hereinafter provided.

2. The Seller guarantees that all material and workmanship in and about the Apparatus and Equipment shall comply with the mutually agreed specifications, drawings and change orders. The standard Seagrave Limited Warranty will apply as provided for in the mutually agreed specifications and change orders. The Limited Warranty is attached hereto and incorporated herein by this reference as Exhibit B. Minor details of materials and construction, not otherwise specified, shall be left to the decision of the Seller who shall be solely responsible for the design, engineering and construction of all features of the apparatus. Any changes to the Agreement or purchase order must be approved in advance through the issuance of a written change order by the Seller. The Seller will not assume responsibility for performing any change requested but not approved by the Purchaser within five (5) days of the change order submission for approval.

3. The Apparatus and Equipment shall be ready for delivery from Clintonville, Wisconsin, within **180** calendar days after the receipt of the (i) mutually agreed specifications, (ii) change order documents and (iii) approval drawing signed by the authorized representative of the Purchaser. The mutually agreed specifications and change order documents and approval drawing shall be delivered to the Purchaser for their signature in not more than 31 days from Agreement receipt at Seagrave or not more than five days from pre-construction meeting, if so provided. Delays due to change orders, strikes, failures to obtain materials, or other causes beyond Seagrave's control will be just cause for delay in delivery. The completed Apparatus and Equipment shall be delivered to the Purchaser at:

   City of Redondo Beach
   415 Diamond Street
   Redondo Beach, CA 90277

4. A competent representative shall, upon request, be furnished by the Seller to demonstrate said Apparatus and Equipment for the Purchaser and to familiarize the Purchaser's employees in the operation and handling of the Apparatus and Equipment.

5. The Purchaser purchases and agrees to pay for said Apparatus and Equipment, the sum of **Nine Hundred Fifteen Thousand, Eight Hundred Thirty-Two Dollars ($915,832.00),** state, federal, FET, or local taxes not included. Payment of any such taxes are the responsibility of the Purchaser. **Terms are net, payment in full upon delivery of the apparatus to the customer. If the Agreement includes Dealer Furnished Equipment and services, the apparatus will be delivered to the customer and payment made, less five (5) percent of the Agreement Price that is held by the fire department until all items and services are provided by the Dealer. The 5% Final Payment and Acceptance will be made once the terms of the Agreement are satisfied by the Dealer.**

5.1 All payments shall be made payable to Seagrave Fire Apparatus, LLC and shall be mailed directly to:

Seagrave Fire Apparatus, LLC
7285 Solutions Center
Chicago, IL 60677-7002

5.2 The Apparatus and Equipment must be paid in full prior to being placed in fire service.

5.3 If more than one piece of Apparatus and Equipment is covered by this Agreement, the above terms of payment shall apply to each piece, and an invoice covering each piece shall be rendered in the proper amount.

6. In the case that no final inspection is made by the Purchaser at the factory prior to shipment and the Purchaser desires to test the Apparatus and Equipment upon receipt, such test shall be made within three (3) days after arrival at the delivery destination specified above. A written report of such test shall be delivered forthwith to the Seller at its principal office at Clintonville, Wisconsin. If no such test be made, or if no such report be made by the Purchaser within three (3) days after arrival, then the Apparatus and Equipment shall be considered as fully complying with the Agreement specifications.

7. It is agreed that the Apparatus and Equipment covered by this Agreement shall remain the property of the Seller until the Apparatus and Equipment is delivered and accepted by the Purchaser, such acceptance shall not be unreasonably withheld or delayed. In case of any default in payment the Seller may take full possession of the Apparatus and Equipment, or of the piece or pieces upon which default has been made, and any payments that have been made shall be applied as rent in full for the use of the Apparatus and Equipment up to date of taking possession.

8. In the event that any applicable Federal or State Regulations (DOT, FMVSS, EPA, etc.), National Fire Protection Association Standards or import tariffs which are enacted during the course of this Agreement, and which requires a change in the Agreement specifications and purchase price in order for the Apparatus and Equipment to comply with such regulation, the parties will execute a change order describing the change in the specifications and increasing the purchase price by an amount equal to the increase in the costs of producing the Apparatus and Equipment.

9. This Agreement shall be governed by and construed in accordance with the laws of the State of California without regard to principles of conflict of laws. Each party hereby consents that the exclusive venue for any dispute of claim relating to this Agreement shall be in the federal courts sitting in Los Angeles County, California. Each party hereby consents to the personal jurisdiction of such courts.

10. Except for damages, claims or losses due to Seagrave's acts of gross negligence, Purchaser or user, to the extent permitted by law, will indemnify and hold Seagrave and Seagrave's property, free and harmless from any liability for losses, claims, injury to or death of any person, including Purchaser or user, or for damage to property arising from Purchaser or user using and possessing the Apparatus and Equipment or from the acts or omissions of any person or persons, including Purchaser or user, using or possessing the Apparatus and Equipment with Purchaser or user's express or implied consent. The provisions hereof shall survive expiration or termination of this Agreement.

11. Risk of loss shall pass to the Purchaser upon delivery and acceptance of the Apparatus and Equipment.

12. To be binding the Agreement must be signed and approved by an Officer of Seagrave Fire Apparatus, LLC. This Agreement and mutually agreed specifications and change order documents take precedence over all previous negotiations, and no representations are considered as entering into this Agreement except as are contained herein or in the mutually agreed specifications and change order documents included herein.

IN WITNESS WHEREOF, the said parties have caused these presents to be executed, on this 21 day of March, 2023.

CITY OF REDONDO BEACH, REDONDO BEACH, CA ("Purchaser")

For

By: DocuSigned by: Nils H. Nehrenheim DC2A3D6CA98045B...
William C. Brand

Title: **Mayor of Redondo Beach**
Purchaser Nils H. Nehrenheim, Mayor Pro Tempore

DocuSigned by: Diane Strickfaden ABED8CF35EEF48C...
Diane Strickfaden, Risk Manager

ATTEST:

By: DocuSigned by: Eleanor Manzano 72F2AC716C214CF...
Eleanor Manzano

Title: City Clerk of Redondo Beach

APPROVED AS TO FORM:

By: DocuSigned by: Michael W. Webb 669049EDE03D402...
Michael W. Webb

Title: City Attorney of Redondo Beach

SEAGRAVE FIRE APPARATUS, LLC ("Seller")

By DocuSigned by: Ulisses D. Parmeziani 3D7AFC487E33421...
Ulisses D. Parmeziani

Title: **President and Chief Executive Officer**
Seller

Date of Acceptance: 3/23/2023 | 9:30 AM CDT

Exhibit “A”

Redondo Beach Fire Department

Long Beach Spec

One (1)
00-03-230B

PAYMENT TERMS

Terms are Net, Payment in Full upon Delivery. If the contract includes Dealer Furnished Equipment and services, the apparatus shall be delivered to the customer and payment made, less five (5) percent of the Contract Price that is held by the customer until all items and services are provided by the Dealer. The 5% Final Payment and Acceptance shall be made once the terms of the contract are satisfied by the Dealer.

One (1)
00-03-2410

PURCHASING COOPERATIVE

The apparatus shall be acquired through the H-GAC purchasing cooperative.

One (1)
00-04-0015

FEDERAL & STATE REGULATIONS, NFPA STANDARDS & IMPORT TARIFFS

In the event that any applicable Federal or State Regulations (DOT, FMVSS, EPA, etc.), National Fire Protection Association Standards or import tariffs which are enacted during the course of this contract, and which requires a change in the contract specifications and purchase price in order for the Apparatus and Equipment to comply with such regulation, the parties will execute a change order describing the change in the specifications and increasing the purchase price by an amount equal to the increase in the costs of producing the Apparatus and Equipment.

One (1)
00-04-0120

INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the design, manufacture, and delivery to the purchaser of a complete fire apparatus equipped as specified herein. These specifications include the general requirements of design, material content and construction as well as certain equipment that shall be provided by the contractor. Not all details of the design, material content and construction of the fire apparatus are herein specified. Any such design, material content and construction not specified herein are left to the sole discretion of the seller contractor.

One (1)
00-04-01A0

COMPLIANCE WITH NFPA 1901

The National Fire Protection Association Standard "NFPA 1901 - Standard for Automotive Fire Apparatus - Current Edition" (hereinafter referred to as NPFA 1901) in effect at the time of the purchase shall be used as a reference and its requirements shall be met by the apparatus manufacturer. The apparatus shall be constructed in accordance with federal and state laws at the time of bid. Any federal, state or NFPA amended changes that shall affect the cost of producing said apparatus shall be charged to the purchaser. Mandatory minor apparatus equipment as stated in the applicable paragraphs of the NFPA standard shall not be provided unless specifically stated and listed in purchaser's written specifications.

Any and all references to "NFPA 1901" within this document shall refer to the current edition of NFPA 1901 in effect at the time of the purchase.

One (1)
00-04-01B0

PURCHASER'S NFPA 1901 RESPONSIBILITIES

In accordance with NFPA 1901, current edition, it shall be the responsibility of the purchaser to specify the following details of the apparatus:

- Its required performance, including where operations at or above elevations of 2000 ft. or on grades greater than 6 percent are required.
- The maximum number of firefighters to ride within the apparatus.
- Specific electrical loads that are to be part of the minimum continuous electrical load as defined in current edition of NFPA 1901 at the time of bid.
- Any hose, ground ladders, or equipment to be carried by the apparatus that exceed the minimum requirements of the NFPA 1901 standard in effect at the time of the bid. Equipment weight and location on the apparatus are the responsibility of the purchaser as a prerequisite of defining the loaded vehicle's vertical center of gravity for rollover stability calculations, when required.

One (1)
00-04-023E

ACQUAINTANCE WITH SPECIFICATIONS

Seagrave Fire Apparatus LLC and its Sales Representatives have reviewed your bid specifications. It is our opinion that the fire apparatus as depicted in this proposal meets or exceeds the requirements of the bid specifications. The purchaser is required to review our Contractor's Specifications contained herein. Because of the intricacies in fire apparatus design, engineering and manufacturing, the Contactor's Specifications, along with any mutually approved changes, shall prevail in the event of a discrepancy between the purchaser's original bid specifications and the contractor's specifications.

One (1)
00-04-0430

SINGLE SOURCE MANUFACTURER

Seagrave is a single source fire apparatus manufacturer. A single source manufacturer is defined as a manufacturer who designs, engineers, and manufactures the entire apparatus in the factory of the bidder. The use of commonly incorporated components such as the diesel engine, the transmission, the pump, lighting fixtures, etc. is acceptable. However, calling the cab/chassis/drivetrain or the outriggers/torque box/aerial device a "component" shall not be acceptable. Single source warranty and service provision from Seagrave Fire Apparatus, LLC and its distributors, sales representatives and service network shall be provided to insure parts availability and undivided warranty responsibility. There shall be no exceptions to these conditions.

One (1)
00-04-1100

DISCONTINUANCE POLICY

The apparatus manufacturer furnishes and installs components which are manufactured by 3rd Party Vendors. From time to time, these products are either changed or discontinued by the manufacturer. The apparatus manufacturer reserves the right to replace a discontinued 3rd Party Vendor manufactured component with an equivalent model.

One (1)
00-04-1110

STANDARD PLACEMENT OF COMPONENTS

Any deviation from the apparatus manufacturer's standard placement shall incur additional charges.

One Hundred Eighty (180)
00-04-5710

COMPLETION DATE

Barring any significant change in our current backlog of orders, and delays due to strikes, war or international conflict, failures to obtain materials, or other causes beyond our control not preventing, the apparatus and equipment detailed in the attached specification shall be delivered to you within approximately One Hundred Eighty (180) Calendar Days after receiving the complete order and signed approval drawing. It shall be understood and agreed that changes requested after the order placement and the resulting signed change orders and approval drawings, if approved, after the order has been released to Engineering, shall constitute a valid cause for production delay and without penalty to the contractor.

One (1)
00-04-7000

APPROVAL DRAWINGS

Following the acceptance of a complete and approved order, three (3) sets of engineering, blueprint type drawings, specifically for this apparatus, shall be provided by the manufacturer and shall be approved by the Fire Department before construction begins. Both the Fire Department and the manufacturer's representative shall have a copy of this drawing. It shall become part of the total contract. These drawings shall be drawn to scale on a CAD system to assure an accurate and professional drawing. The drawing shall show five (5) views of the vehicle (front, rear, both sides and top). The drawings shall show the wheelbase and overall dimensions of the apparatus, final compartment sizes and features, booster tank position, the location of all emergency warning equipment, work, and scene lights.

One (1)
00-04-7100

CHANGE ORDERS

To ensure the proper engineering and construction of the purchaser's custom fire apparatus in a timely manner, the contractor shall consider the order final and complete at placement of the order. Change orders requested after the order placement are discouraged. It shall be understood and agreed that any changes, if approved, after the order has been released to Engineering, shall constitute a valid cause for production delay and without penalty to the contractor.

One (1)
00-04-823C

IN-PROCESS INSPECTION TRIP

One (1) modified "Pre-construction / In-Process" inspection trip for representatives of the purchaser shall be included in the bid. The inspection shall take place at the Seagrave factory in Clintonville, WI, during normal business hours, Monday-Friday. The cost of transportation, meals and lodging shall be included. A distributor or sales representative shall accompany the purchaser on the inspection trip. The inspection shall not be longer than one (1) day unless multiple vehicles are being inspected.

Three (3)
00-04-823Z

Three (3) fire department representatives shall attend the In-Process Inspection.

Four (4)
00-04-831C

FINAL INSPECTION TRIP

One (1) "Final" inspection trip for representatives of the purchaser shall be included in the bid. The inspection shall take place at a Company facility or an authorized representative's facility of the Company's during normal business hours, Monday - Friday. The selection of the inspection location shall be done at the sole discretion of the Company. The reasonable and customary cost of transportation, meals and lodging shall be included. An authorized distributor or manufacturer's sales representative may accompany the Purchaser on the inspection trip.

Three (3)
00-04-834Z

Four (3) fire department representatives shall attend the Final Inspection.

One (1)
00-04-8360

UNDERSIDE FINAL INSPECTION

During "Final" Inspection, the complete vehicle shall be raised, allowing the Fire Department Inspection team to walk under the apparatus to review the complete underside.

One (1)
00-04-8366

PUMP OPERATION FINAL INSPECTION

During "Final" Inspection, the vehicle shall be pumped at the manufacturer's facility. The operation shall be for no more than one (1) hour and shall consist of water only.

One (1)
00-04-8400

PRE-DELIVERY ROAD TRIP AND FINAL FACTORY CHECKLIST

Prior to delivery, the completed apparatus shall be thoroughly inspected by the factory. This inspection shall include a road test of the apparatus. During the factory inspections and road testing, a checklist shall be utilized by factory personnel to document the inspection and road test results. The checklist shall include:

- Documentation of the make, model, and serial numbers of all major components such as the engine, transmission, pump, axles, etc.
- Complete, comprehensive operational check of all chassis/drive train components and fluid levels.
- A comprehensive review of the entire exterior and interior of the apparatus for fit and finish, checked against the customer's order specifications, and any ensuing change orders.
- A thorough test of all driving systems under actual highway and city driving conditions.

One (1)
00-04-8470

DELIVERY

The fire apparatus shall be delivered over the road and under its own power to insure proper break-in of all driving components while still under warranty. Rail or truck freight shipment of the apparatus is not acceptable.

Delivery shall be to an area located in Zone 10.

One (1)
00-04-8510

FAMILIARIZATION

An experienced and qualified distributor or sales representative shall familiarize Fire Department personnel (as designated by the authority in charge) in the proper operation, care and maintenance of the apparatus delivered.

The representative must be a qualified, trained agent of the local authorized distributor or sales representative, or a direct employee of the manufacturer of the apparatus.

The familiarization period shall be during the normal work week (Monday - Friday). The schedule of the instruction sessions shall be arranged by mutual agreement of the Fire Department and the delivering authority. The number, length and time of the sessions may vary due to the nature of the apparatus and availability of attendees and must be approved in advance.

One (1)
00-05-013A

GENERAL DESIGN REQUIREMENTS

The specified apparatus shall be a custom cab type; designed, engineered, and manufactured specifically for the fire service in North America. The apparatus meets or exceeds the requirements of the NFPA 1901, current edition, in all respects.

Seagrave's deluxe custom cab chassis shall be provided. It incorporates an all-steel cab for strength, durability, and safety. The cab and body sheet metal shall be constructed of stainless-steel, no exception. The Seagrave cab incorporates a protective safety-cage design that totally surrounds and protects the seat belted driver, officer, and crew. The safety-cage, composed of heavy gauge stainless-steel, makes the Seagrave deluxe cab an extremely strong cab.

One (1)
00-05-0210

GROSS VEHICLE WEIGHT

The manufacturer shall be responsible for proper weight distribution upon the chassis and axles. The apparatus when loaded, shall have not less than 25% nor more than 45% of the weight on the front axle and not less than 55% nor more than 75% on the rear axle. A certified weight certificate showing weights on the front axle, rear axle, and total weight for the completed apparatus with the water and fuel tanks full, but without personnel, equipment and hose shall be provided at the time of delivery.

In accordance with NFPA 1901, it shall be the responsibility of the purchaser to notify the manufacturer in the purchaser's specification of any hose, ground ladders, or equipment to be carried by the apparatus that exceeds the minimum requirements of the NFPA 1901 standard in effect at the time of the bid.

One (1)
00-05-032Y

CUSTOMER DECLARED EQUIPMENT WEIGHT

The customer declared equipment weight shall be from 1251 to 2000 pounds. This weight shall be evenly distributed.

One (1)
00-05-0420

VEHICLE PERFORMANCE ANALYSIS

A performance analysis report shall be run on the vehicle, as ordered, using computer software to determine top speed, gradeability, optimum shift points and acceleration on various grades. The report shall be delivered with the completed vehicle but shall be available prior to engineering of the vehicle.

One (1)
00-05-2000

GENERAL CONSTRUCTION, QUALITY AND WORKMANSHIP

The design and construction of the apparatus shall embody standard automotive heavy vehicle engineering practices. The apparatus shall be designed, engineered, and constructed with consideration for the severe service nature of the fire service. All parts of the apparatus shall be installed in accordance with the OEM specifications.
Distribution of load between the front and rear axles shall be engineered so that all specified equipment, including a filled water tank, full complement of personnel and fire hose shall be carried without damage to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association and current standard automotive practices.

All welding personnel that shall be utilized in the fabrication and construction of structural components of the apparatus chassis, body and aerial device shall hold a valid certificate from the AWS - American Welding Society.

The apparatus shall be designed to conform to applicable ANSI and NFPA 1901 standards. The following design criteria shall be applicable to this specification to the extent specified herein:
- American Society for Testing Materials (ASTM) - A-36, Specification for Structural Steel
- Society of Automotive Engineers, Inc. (SAE) - SAE Handbook
- American Welding Society (AWS) - AWSO14.4-77 Classification and Application of Welded Joints for Machinery and Equipment
- American Society for Non-Destructive Testing (ASNT)

All sensitive components shall be protected against adverse weather conditions. Any exposed metal surface which is not painted or otherwise coated shall have a bright finish. Corrosion protection shall be provided between any dissimilar metals joined in the construction of this apparatus.

One (1)
00-05-2110

STEPPING SURFACE CERTIFICATION

A certification that all materials used for exterior surfaces designated as stepping, standing, and walking areas, all interior steps and all interior floors meet the slip resistance requirements of the applicable edition and section of NFPA 1901 shall be provided with the delivery documentation.

One (1)
00-05-300S

PUMP TEST AND CERTIFICATION

The fire pump shall be third party tested at the apparatus manufacturer's facility and shall conform to NFPA requirements and standards. Copies of all tests and the manufacturer's record of pump construction details shall be provided with the delivery documentation.

One (1)
00-05-4000

PERFORMANCE REQUIREMENTS AND TEST - NFPA

A road test shall be conducted with the apparatus loaded per NFPA recommendations (unless otherwise specified) and a continuous run of ten (10) miles or more shall be made during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus.

The apparatus must be capable of accelerating to 35 mph from a standing start within 25 seconds on a level highway without exceeding the maximum governed rpm of the engine.

The fully loaded vehicle shall be capable of obtaining a minimum top speed of 50 mph on a level highway with the engine not exceeding its governed rpm (full load).

The apparatus shall be able to maintain a speed of 20 mph on any grade up to and including 6%.

The service brakes shall be capable of stopping the fully loaded vehicle in 35 feet at 20 mph on a level highway.

The apparatus shall be tested and approved in accordance with NFPA standard practices.

One (1)

== Cab/Chas - CAP Pumper - 0.000 ==

One (1)
10-00-3010

GENERAL

Chassis shall be a new, heavy-duty, custom fire apparatus design built expressly for the fire service. All standard components that have not been specified shall be provided.

Chassis shall be designed, engineered, and built by the bidder and be the manufacturer's first line custom chassis.

The chassis shall be suitable for heavy duty service with all components having adequate strength and capacity for the intended load to be sustained and the type of service required.

One (1)
10-00-9910

WHEELBASE

The wheelbase shall be: 177.50 inches.

Six (6)
10-00-9920

SEATING CAPACITY

The safe seating capacity of the cab for properly belted passengers shall be: Six (6)

One (1)
10-00-9935

APPROACH - DEPARTURE ANGLES

An angle of approach and an angle of departure of at least 8 degrees shall be maintained at the front and the rear of the vehicle when it is loaded to the estimated in-service weight, as defined by NFPA 1901 current edition.

One (1)
10-00-9940

GROSS VEHICLE WEIGHT RATINGS

Front Vehicle Weight Rating shall be: 20,000
Rear Vehicle Weight Rating shall be: 24,000
Gross Vehicle Weight Rating shall be: 44,000

One (1)
10-10-1000

FRAME

The chassis frame shall be built with two steel channels with a minimum of five (5) cross members. Pump shall not be counted as a cross member. The side rails shall be of heat-treated steel. Each rail shall have a section modulus of 16.4, a minimum elastic limit of 120,000 PSI and a minimum resisting bending moment of 2,124,000-inch pounds. The cross members shall be of heavy duty, fabricated, all-welded design, made out of a minimum of 50,000 psi material. The frame and cross members shall be a bolted assembly utilizing 5/8" flange head grade eight bolts and Spiralock® flange nuts. Spiralock® nuts shall be used exclusively in the frame assembly for mounting spring hangers, steering gear, engine, transmission, etc. because of their ability to maintain a constant torque tension and prevent vibration loosening. Their design shall provide for an even thread load distribution over the bolt, increased fatigue strength and life, and clamping torque. All holes made must be used and any holes in the frame for options not required on this chassis are not acceptable.

Frame rails less than or equal to 480" in length shall receive a duo-coat primer: an E-coat followed by a powder coating. This duo-coat process meets 1000 hours of salt spray testing per ASTM B117 test procedure. Frame rails greater than 480" in length shall be powder coated only. The inside of the rails shall be hand re-sprayed to insure coverage. This process meets 240 hours of salt spray testing per ASTM B117 test procedure.

One (1)
10-11-0000

BUMPER

A heavy duty, 10" high, ribbed, highly polished stainless-steel bumper shall be mounted to the front of the chassis. The bumper shall be a "ribbed" cross section shape with 2" flanges and rounded corners.

As part of the bumper extension, a second formed channel with 2" flanges shall be provided directly behind the full width of the flat portion of the bumper. The bumper extension support shall be of channel (minimum 9-7/16" x 3" x 3/8") construction, bolted to the chassis frame stub. A 3/16" aluminum tread plate gravel pan (deck) contoured to fit just below the front face of the cab and just below the upper bumper flange shall be provided. The gravel pan shall not be fastened to the top flange of the bumper.

One (1)
10-12-0012

8" BUMPER EXTENSION

A bumper extension shall be installed at the front of the cab. The front of the bumper shall be approximately 8" from the front face of the cab. A gravel pan made of 3/16" aluminum tread plate shall be installed between the front bumper and the cab.
The bumper extension shall be designed and constructed so that the apparatus can be pulled by the extension.

One (1)
10-12-00A0

LIFTABLE AND TOWABLE BUMPER EXTENSION

The bumper extension shall be designed and constructed so that the apparatus can be lifted and towed by the extension.

One (1)
10-12-152P

BUMPER PREPPED FOR LEFT SIDE Q2B SIREN

The left side of the bumper shall be prepared to accommodate a surface mounted Federal Q2B siren. When installed, the Q2B vanes shall stick out in front of the bumper.

One (1)
10-12-8010

FAMA26 NO-STEP SIGN

In accordance with NFPA 1901 chapter 15.7.1.6, a FAMA26 "No-Step" sign shall be attached to the top of the gravel pan. The sign reads: "Fall Hazard-Railings NOT provided. Surface may be slippery - Not intended for stepping, standing, or walking. Fall will injure or kill".

One (1)
10-20-0200

FRONT TOW HOOKS

Two (2) chrome tow hooks shall be furnished below the bumper securely attached to the bumper support.

One (1)
10-20-0300

FRONT TOW EYES

Two (2) chrome plated "cut plate" type tow eyes shall be furnished. They shall be installed through the front face of the bumper and securely attached to the bumper extension frame. The eyes shall be .50" from the front bumper face and fabricated of 1" thick steel plate with a 3" diameter opening.

One (1)
10-22-0100

REAR TOW LOOPS

Two (2) painted rear tow loops shall be provided, welded to the underside of the rear step subframe. The loops shall be rated at 9000 pounds straight pull. They shall be painted to match the frame/undercarriage.

A label shall be provided on the structure, between the two loops, Stating 9000# rating.

One (1)
10-25-0100

STEERING

A heavy duty 18,000 lb. capacity power steering system shall be provided. The hydraulic pump shall be engine gear driven.
The steering gear "box", or fixture that the gear is mounted to, shall be fabricated in the factory of the bidder. It shall be a welded assembly constructed of 3/8" formed steel with a 3/4" face plate. Vertical gussets shall be provided between the face plate and the frame mounting plate to insure against frame flex while the vehicle is stationary.

One (1)
10-25-1300

AUXILIARY CYLINDER FOR POWER STEERING

An auxiliary power assist cylinder shall be provided in the power steering system.

One (1)
10-25-2000

CHASSIS ALIGNMENT

The chassis frame rails shall be cross checked for length and square. Front and rear axles shall be laser aligned. The front axle shall be aligned at the manufacturer's facility.

One (1)
10-25-21PW

CHAFING PROTECTION

Chafing protection shall be provided where lines run against edges of the frame/crossmembers, see QW 22-00-0105 for additional information.

One (1)
10-28-0100

AIR PIPING

The service brake system shall be full air type. The system is to meet or exceed current FMVSS-121 requirements. Other components or accessories shall be as follows:

Pressure protection valve
Quick build up system
Engine mounted; gear driven air compressor
Bendix Model E-6 dual circuit brake treadle valve
Two (2) air pressure gauges on cab dash with indicator light and buzzer
Air reservoirs with capacity to meet FMVSS-121

The Bendix SR-7 valve, in conjunction with the double check valve, shall enable modulation of the spring brakes in the event of a service brake air system failure to allow the vehicle to be stopped.
Brake piping shall consist of SAE approved; DOT rated "Synflex" reinforced colored nylon tubing. The lines shall be wrapped in a heat protective loom where necessary in the chassis. Braided hoses shall provide flexibility between axle and frame connections. Brake air lines shall be color-coded. Air inlet to air brake compressor shall be from the engine intake manifold, i.e., after transition through the engine air cleaner. A flexible stainless-steel braided Teflon hose and/or copper tubing shall be provided from the compressor to the air dryer. Fittings shall be brass.

The parking brake system is to be the spring set type operated by control valve on driver's console. A brake indicator light shall also be provided.

All airline fittings to be Compression style. NO PUSH LOCK FITTINGS TO BE USED ANYWHERE ON THE APPARATUS, INCLUDING AIR LINES GOING TO THE OPERATOR'S STAND.
Scuff/Rub protection shall be provided at all locations in the frame and the bulkhead where any airline passes through.

No electrical harness or air lines shall be attached to the copper tube that runs in the frame rail to the air dryer.

No air piping shall be painted.

Two (2)
10-28-0400

MAIN AIR SYSTEM DRAIN VALVE(S)

The drain valve(s) on the main air system reservoirs shall be manual.

One (1)
10-28-0600

WET TANK

A 1250 cubic inch wet air tank shall be provided with the air system.

One (1)
10-28-0610

WET AIR RESERVOIR DRAIN CONTROL

A cable-controlled drain valve shall be provided on the wet tank. The pull cable shall be extended to the side of the truck with a loop provided at its end. It shall be labeled: Drain Daily.

One (1)
10-28-3820

AIR DRYER

A Meritor WABCO 1200 System Saver air dryer shall be installed in the air brake system. It shall have a minimum capacity of 30 cfm air flow. Dryer shall be equipped with an integral, automatic, 12-volt heated moisture ejector which is thermostatically controlled. System shall include a pressure-controlled check valve installed between the wet tank and the secondary air reservoir.

The drain tube to be added to direct blow off to the ground, hang approximately 12" below the air dryer, customer to determine exact length at final inspection.

The blow off where the drain tube is connected shall be straight to the ground with no items below.

One (1)
10-28-48PP

AUXILIARY AIR OUTLET

There shall be a 1/4" female air outlet with NPT plug mounted on the driver's side pump panel. A 1/4 turn shutoff valve shall be located adjacent to the outlet. The outlet shall be connected to the apparatus air reservoir tank.

One (1)
10-28-56SW

AUXILIARY AIR INLET

There shall be an auxiliary air inlet installed on the front of the driver's sidestep well to maintain the chassis air pressure while the engine is not running. A check valve shall be installed in the line to prevent outflow of air pressure from the "wet" or "supply" tank.

Locate in the forward upper corner of the step well.

One (1)
11-00-360A

FRONT AXLE

A Meritor MFS front axle with a 20,000-pound rating shall be provided. It shall include composite low-friction bushings with diagonal grooves to better distribute lube, camber settings of +1/4 degree for both left and right sides to help improve tire life and a large diameter, heat treated kingpin with a lube retaining seal.

DISC BRAKES

The front axle shall be provided with Meritor #EX225H air disc brakes with internal automatic adjustment, sealed synchronized twin pistons and robust sealing of slide pins for environmental protection. The #EX225H air disc brakes shall have 17" rotors and a fully sealed lever mechanism with variable mechanical ratio. A visual indicator of brake wear shall also be provided.

FRONT SEMI-ELLIPTICAL SPRING SUSPENSION, 4" X 52"

The front suspension shall be semi-elliptical 4" x 52" constant rate type "high arch" springs with a military wrapped eye. The correct material, spring length, width, thickness, and number shall be provided to match the leaf spring rating with that of the gross axle weight rating of the vehicle.

SHOCK ABSORBERS

Gabriel heavy-duty telescoping shock absorbers shall also be provided on the front axle.

One (1)
11-10-0400

REAR AXLE

The rear axle shall be a Meritor model RS23-186 with a capacity of 24,000 pounds at the hub. The rear axle shall be provided with Meritor #EX225H air disc brakes with internal automatic adjustment, sealed synchronized twin pistons and robust sealing of slide pins for environmental protection. The #EX225H air disc brakes shall have 17" rotors and a fully sealed lever mechanism with variable mechanical ratio. A visual indicator of brake wear shall also be provided.

All axles shall be purchased complete from and certified by the axle manufacturer for the specific application. Brake chamber brand and size shall be determined by the axle manufacturer.

One (1)
11-10-9900

All axle applications must be certified by the axle manufacturer.

One (1)
11-10-9920

REAR AXLE RATIO

The rear axle ratio is: 5.63.

One (1)
11-10-9999

ROAD SPEED

The top road speed of the vehicle shall be 68 MPH.

One (1)
11-20-2600

ANTI-LOCK BRAKING SYSTEM (ABS)

The vehicle shall be equipped with a WABCO 4S4M anti-lock braking system (ABS). The ABS shall provide four (4) channel anti-lock-up braking control on the (2) front and (2) rear wheels.

The system shall employ a digital electronics system with microprocessor controls divided into two (2) diagonal circuits. In the event of one circuit malfunction the second circuit shall operate unaffected. Each wheel shall be constantly monitored by the system when the vehicle is in motion. When any wheel begins to lock-up during braking, a signal shall be transmitted to the processor from the wheel sensor. The control unit shall instantly reduce the braking force applied to the wheel and immediately re-apply braking force so that the wheel rapidly slows without locking. The system shall control all wheels simultaneously to provide maximum vehicle braking in a relatively straight line.

An ABS warning light shall be installed in the warning light panel of the driver's dash.

The ABS system shall automatically disengage the auxiliary braking system whenever the anti-lock braking mode is active.

One (1)
11-20-2650

LUBRICATION MANIFOLDS

Rear shackle and pin lubrication manifolds shall be provided one (1) each side of the body rear of the mud flaps. The manifold shall be labeled "REAR SHACKLE & PIN LUBRICATION".

Flexible hoses shall be provided designed for the intended use.

One (1)
11-20-2770

VEHICLE STABILITY COMPLIANCE

In compliance with NFPA 1901, current edition, the vehicle stability compliance shall be performed on a tilt table.

One (1)
11-20-2795

AUTOMATIC TRACTION CONTROL WITH DEEP SNOW AND MUD SWITCH

Automatic Traction Control, working in concert with the ABS system, shall be provided which shall reduce wheel slip on acceleration on wet or slippery road conditions. A light shall illuminate on the driver's dash when the drive wheels slip during acceleration.

A deep snow and mud option switch shall be provided in addition to the ATC option. This function increases available traction on extra soft surfaces like snow, mud, or gravel by slightly increasing the permissible wheel spin.

One (1)
11-30-3100

REAR SEMI-ELLIPTICAL SPRING SUSPENSION, 3" X 52", SINGLE - 24,000#

The rear suspension shall be semi-elliptical 3" x 52" constant rate type springs with a military wrapped eye. The correct material, spring length, width, thickness, and number shall be provided to match the leaf spring rating with that of the gross axle weight rating of the vehicle.

Two (2)
12-15-1200

FRONT TIRES

The two (2) front tires shall be Michelin 315/80R22.5, XZUS2, load range "L" with on/off road tread (heavy loads and slower speeds, operating on a mixture of improved secondary and aggressive road surface). This tire has a nominal rating of 10,000 pounds with a top speed of 65 mph and an intermittent fire service rating of 10,000 pounds at a top speed of 75 mph.

Tires shall be manufactured no more than one year at the time of final inspection of the vehicle.

Four (4)
12-16-0500

REAR TIRES

The four (4) rear tires shall be Michelin 11R22.5, XDN2, load range "H", neige tread (all-weather premium drive tire optimized for exceptional traction and mileage). This tire has a nominal rating of 6,005 pounds with a top speed of 75 mph and an intermittent fire service rating of 6,425 pounds at a top speed of 75 mph.

Tires shall be manufactured no more than one year at the time of final inspection of the vehicle.

One (1)
12-50-0500

WHEELS

Wheels shall be Alcoa polished aluminum disc type and hub piloted. Chrome plated nut covers shall be furnished.

One (1)
12-80-0100

FRONT AXLE "BABY MOON" HUB CAPS

Stainless-steel "Baby Moon" type hub caps shall be provided on the front axle.

One (1)
12-90-0200

REAR AXLE "HIGH HAT" HUB CAPS

Stainless-steel "High Hat" type hub caps shall be provided on the rear axle(s).

One (1)
12-90-1010

TIRE PRESSURE INDICATORS

Tires shall have non-pressure indicators installed for shipment.

Accu-Pressure Heavy Duty Safety Caps shall be provided and shipped loose. This valve stem inflation pressure sensitive monitor shall provide a visual color indication of when the tire pressure is below the manufacturers recommended level. The chrome safety cap shall show green when the tire is properly inflated and red once the tire becomes under inflated.

All inner wheels shall be equipped with a valve stem extension that shall allow the inner wheel to be filled without removing the outer wheel.

One (1)
12-90-1205

No Tire Balance Compound Inserted into Front Tires

One (1)
13-00-5310

ENGINE

The chassis shall be powered by an EPA21/OBD21 certified and compliant Cummins X12 diesel engine, as described below:

• Model	X12
• Number of Cylinders	Six
• Bore and Stroke	5.2 x 5.67 in
• Displacement Liter (Cu. In.)	11.8 (720)
• Rated BHP	500 @ 1800 RPM
• Torque	1700 ft.lb. @ 1000 RPM
• Governed RPM	2000
• Oil Capacity / Type	10.5 gallons / SAE CK-4
• Fuel Requirement	Ultra low sulfur diesel (15 ppm max.)

Standard equipment on the engine shall include the following:

- Selective Catalytic Reduction (SCR) after treatment
- Cooled Exhaust Gas Recirculation system
- Fan – 32", 11 blade
- Charge air cooling
- High pressure, common rail fuel system
- Fuel filter with check valve and water separator
- Fuel strainer
- Governor – electronic, interact system
- Injectors – electronically controlled full authority injection
- Lube oil cooler – integral
- Lube oil filter – full flow
- Turbocharger – variable geometry type
- Air compressor – Wabco 26.0 CFM

The engine exhaust system shall be a horizontal design constructed from heavy-duty truck components. Flexible couplings shall be utilized to absorb the torque and vibration of the engine. The outlet shall be directed to the forward side of the rear wheels, exiting the right side, with a straight tip. A heat-absorbing sleeve shall be used on the exhaust pipe in the engine compartment area to reduce stored heat, providing protection for the alternator, and also to protect hands when checking or adding oil in the engine compartment.

ENGINE AND CHARGED AIR COOLING SYSTEMS

A serpentine core type radiator with continuous louvered copper fin design shall be provided. Radiator shall be fitted with formed steel side frames. The top tank shall have a built-in de-aeration system. A drain shall be located at the lowest point.

The engine charged air heat exchanger shall be located directly in front of the radiator and be bolted to its side rails. It shall be all aluminum-brazed construction. Air cooler shall be cross flow design with cast aluminum side tanks, horizontal inlet and outlet at top and aluminum louvered serpentine external air fins. Plastic tanks shall not be acceptable, no exceptions. Cooler tubers shall also be constructed of aluminum and have internal fins that eliminate laminar airflow.

The charge air cooler and the radiator shall be produced by the same manufacturer as a single assembly to provide continuity throughout the cooling system. This shall ensure a certified "balanced" package for the chassis engine air and fluid cooling systems.

The radiator and charger cooler shall be mounted to the chassis stub. Fabricated mounting bracket for the fans ring shall be attached to the front of the engine in a manner so that it "floats" with the engine and increases the fan's efficiency by tightening the tip clearance. This mounting design eliminates engine fan and radiator shroud contact due to engine torque movement and promotes more efficient airflow. The radiator and charger cooler shall be held in place at the bottom by two (2) large bolts equipped with anti-stress rubber biscuits.
The top of the radiator shall be supported by two (2). ¾" tubular braces, bolted to the chassis stub. Anti-vibration rubber biscuits shall be installed at the top threaded end of the braces where they attach to the radiator.

One (1)
13-00-7000

ENGINE COOLING CERTIFICATION

"EPQ" (End Product Questionnaire) certification shall be provided by the chassis manufacturer. Certification shall be documented with reference to each specific chassis model by the chassis manufacturer.

One (1)
13-00-7520

FAN CLUTCH

A fan clutch shall be provided for the engine cooling fan. The clutch shall be of a failsafe design, in that it shall fail in the "on" mode and thus prevent overheating in the event of component or airline failure. Manufacturer shall also wire the clutch so that it remains "on" in the pumping mode to prevent water pressure fluctuations.

One (1)
13-00-760S

COOLANT OVERFLOW RESERVOIR

A six (6) quart coolant overflow reservoir shall be provided. It shall be accessed in the officer's step well. A hinged aluminum tread plate door with small D-ring handle shall be provided for access.

A visual inspection shall be possible without tilting the cab (NO EXCEPTIONS). The aluminum tread plate door shall be properly labeled.

One (1)
13-01-2100

SILICONE HOSES

All hoses in the cooling system shall be silicone type with stainless-steel constant torque Oetiker clamps.

There shall be no paint on any of the silicone hoses.

One (1)
13-01-2400

SKID PLATE

A radiator skid plate shall be provided to protect the radiator from debris. The skid plate shall cover the lower radiator tank and shall be painted to match the frame rails.

One (1)
13-03-1200

TRANSMISSION

An Allison, Model 4000 - EVS, electronically controlled automatic transmission with integral fluid filter shall be provided. A transmission cooler shall be installed in the radiator bottom tank. A warning light and buzzer shall be provided on the cab dash to alert the driver should the transmission overheat.

The transmission shall include the following: an oil life monitor, a filter life monitor, and a transmission health monitor. The oil life monitor determines fluid life remaining by monitoring various operating parameters. The filter life monitor determines when fluid filter(s) need to be replaced. The transmission health monitor determines when clutch system inspection is required. The monitors send a message via a blink code to a special prognostic light on the shift pad. Also, on the shift pad shall be installed a digital, double-digit display that identifies the level of transmission oil. The display shall identify the oil level as "Ok," "Lo" or "Hi", also indicating the number of quarts lo or hi.

The transmission shall include the following emergency vehicle specifications:

Maximum gross input power:	600 hp
Maximum gross input torque:	1850 ft.lb.
Input speed range:	1700 to 2300 rpm
Direct gear lock-up:	4^{th} @ 1.00 to 1.00
Overdrive gear and ratio:	5^{th} @ 0.74 to 1.00

Gear ratios shall be as follows:

1st	3.51 to 1
2nd	1.91 to 1
3rd	1.43 to 1
4th	1.00 to 1
5th	0.74 to 1
6th	0.64 to 1
Rev	-4.80 to 1

The transmission shall automatically shift into neutral whenever the chassis parking brake is applied.

One (1)
13-03-2015

TRANSMISSION FLUID

The Allison 4000-EVS transmission shall be delivered from the factory with a synthetic SAE standard ATF, Transynd.

One (1)
13-03-3300

TRANSMISSION PROGRAMMING

The transmission shall be programmed as a full 6-speed automatic.

One (1)
13-03-4000

TOUCH PAD TRANSMISSION SHIFT CONTROL

Touch pad control shift module shall be mounted to the right of the driver on the console and be indirect lighted for after dark operation.

One (1)
13-05-0130

DRIVELINE

Drivelines shall be built with heavy-duty metal tubes and utilize Spicer 1810 series or "Equal" mechanics type universal joints with "half round" end yokes. This quick disconnect strap and bolt design type end joint shall allow the driveline to be easily disassembled and dropped straight down for ease of service and maintenance. They also shall be dynamically balanced by the truck manufacturer before installation in the chassis. A splined slip joint is to be provided in each shaft assembly. A grease zerk shall be provided for lubrication of the slip joint.

One (1)
13-08-2500

FUEL SYSTEM

The vehicle shall be furnished with a 65-gallon fuel tank mounted behind the rear axle and just below the frame rails using a stainless-steel strap. The tank shall be constructed of hot rolled, pickled in oil steel, and equipped with a swash partition and vent. The fuel tank shall meet all FHWA requirements including a fill capacity of 95% of tank volume and all DOT and FMVSS regulations for rollover protection.

A 2" diameter fill inlet shall be provided. Fuel cap shall be of brass or bronze construction, non-vented and have lead safety fuses. It shall be chained to inlet tube or to the body sheet metal to prevent loss. Braided hoses shall be provided for the fuel lines. A 1/2" NPT drain plug shall be located at the bottom of the tank. The tank shall be installed using stainless-steel straps and hardware, separated from the tank by a rubber insulating strip to prevent against chaffing. On trucks without torque boxes, the fuel tank pickup tube and sending unit shall be accessible without having to remove the tank.

The stainless-steel fuel fill inlet shall be located on the left (drivers) side of the apparatus. It shall be concealed behind a door. The inside of the door shall be marked "ULTRA LOW SULFUR DIESEL FUEL ONLY". The fuel inlet area, recessed behind the door, shall be completely enclosed to prevent dirt and debris from entering. Provision shall be provided inside the fill recess for drainage of any spilled fuel within the cavity.

Special care and consideration shall be given to prevent shavings and debris in the fuel tank, issue on previous order.

One (1)
13-08-2995

OFFICER'S SIDE ADDITIONAL FUEL FILL INLET

An additional stainless-steel fuel fill inlet shall be provided on the officer's side. It shall be concealed behind a door. The inside of the door shall be marked "ULTRA LOW SULFUR DIESEL FUEL ONLY". The fuel inlet area, recessed behind the door, shall be completely enclosed to prevent dirt and debris from entering. Provision shall be provided inside the fill recess for drainage of any spilled fuel within the cavity.

Two (2)
13-08-3060

The fuel door shall be constructed of stainless-steel and shall have a brushed finish. It shall be vertically hinged along the side of the door towards the front of the apparatus. A magnet shall hold the door in the closed position.
The door shall be kinked along 3 edges with the fourth side being used as s finger grab for opening and closing it. A stainless-steel trim ring shall encircle the opening to prevent the fuel nozzle from damaging the surrounding surface when it is opened. The fuel shelf shall be made from a high impact polyethylene material.

One (1)
13-08-5400

ENGINE FUEL COOLER

An engine fuel cooler shall be provided on the apparatus. The engine fuel cooler shall cool the returning fuel from the engine using the water from the water pump.

One (1)
13-08-5630

FUEL WATER SEPARATOR WITH ALARM & HEATER

A Racor Greenmax™ model 4400R1210 fuel water separator with 10-micron Aquabloc filter, water sensor alarm and heater shall be provided.

The fuel water separator shall be mounted in an area for ease of servicing.

One (1)
13-09-0020

ENGINE STARTER

A Delco, 12-volt, 39 MT-HD starter shall be installed.

One (1)
13-10-2500

ALTERNATOR

A 430-amp Delco alternator, model 55SI, shall be provided.

One (1)
13-11-0410

AIR COMPRESSOR

A Wabco 26.0 cfm air compressor shall be furnished. The air compressor shall be gear driven off the engine.

One (1)
13-12-0510

AIR CLEANER

A Racor Ecolite® dry type engine air cleaner shall be provided. It shall be installed in a location above the chassis frame rails and no less than 40" above the ground. A visual inspection shall be possible without tilting the cab (No Exceptions). The air cleaner shall be serviceable through an access opening of no less than 30" wide by 13" high.

One (1)
13-12-5500

AIR RESTRICTION INDICATOR IN INFORMATION DISPLAY CENTER

An electrical engine air restriction indicator shall be provided and installed in the cab information display center.

One (1)
13-13-0008

EXHAUST

A single exhaust module containing an SCR chamber and a DPF chamber shall be installed on the right side of the vehicle, immediately behind the cab. The exhaust module shall ingest urea from a remote storage tank to remove NOx from the exhaust. The exhaust assembly shall be mounted outboard of the frame rail.

One (1)
13-13-0030

DPF REGENERATION PROCESS

NFPA 12.2.6.7.1 The regeneration process shall be activated by two methods:

1) Automatically by the engine system but only when the transmission is in gear and the speedometer indicates a speed above 5 mph (8km/hr.) whether the apparatus is in motion or is operating in stationary pump mode with an engine rpm sufficient to register 5 mph (8 km/hr.) on the speedometer.

2) Manually when initiated by activation of a switch located in the driver's area of the driving compartment.

There shall also be an inhibit switch placed near the driver to inhibit an automatic reburn.

One (1)
13-13-0055

DEF & DEF ACCESS

The urea mixture, a solution of 2/3 water and 1/3 urea which reacts with NOx to create nitrogen and water, shall be stored in a 10-gallon tank equipped with a level sensor and alarm to prevent run-out.

The filling or adding of DEF to the DEF tank shall be available without tilting the cab (No Exceptions). Access to the urea tank fill connections and level sensor shall be available without tilting the cab.

One (1)
13-13-0059

DEF FILL ACCESS DOOR

An aluminum tread plate hinged door shall be provided for access to the DEF fill cap and neck. The DEF fill access shall be located on the left-hand side of the cab, under the crew cab floor behind the crew cab step well battery access hinged door. The DEF fill access area shall contain a fill neck.

One (1)
13-13-0900

TAILPIPE EXTENSION

The tailpipe shall be provided to accommodate a Plymovent exhaust evacuation system. The tailpipe shall be mounted perpendicular to the side of the truck and be flush with the body. 12" of clearance between the pipe and the tire will be provided. The tailpipe mounting shall be straight out from the body.

It is understood that the engine exhausts cannot be connected to exhaust evacuation systems when the Diesel Oxidation Catalyst and Diesel Particulate Filter on the engine are regenerating.

Shall be reinforced with a muffler clamp for the magnetic Plymovent.

One (1)
13-13-1130

EXHAUST HEAT SHIELDS

Heat shields shall be provided as needed to prevent damage to body and wiring from excessive exhaust temperatures. The exhaust pipe shall be wrapped in multi-layered insulation blankets, from just aft of the turbo down to inlet side of the DPF. Each blanket shall have a fiberglass inner layer and a silicone impregnated fiberglass cloth outer layer

The cab shall receive 1.25" thick foil back insulation blanket under the crew floor to reduce floor temperatures.

All harnesses and cables, in proximity to exhaust system components, shall be protected with insulation.

One (1)
13-15-0800

ENGINE BRAKE

A Cummins engine brake shall be installed with controls within easy reach of the driver. Brake shall automatically be actuated when the accelerator pedal is released. The engine brake shall be wired in conjunction with the rear brake lights so that they are activated when the engine brake is engaged. It shall have a three-position switch: "LOW", "MEDIUM" and "HIGH" along with an "OFF" and "ON" switch.

Due to location on dash layout, switches shall not be Backlit, labels shall be provided.

One (1)
13-15-1610

AGGRESSIVE DOWN SHIFT

An aggressive down shift shall be provided. This shall be tied to the auxiliary brake switch and the aggressive down shift shall only function when the auxiliary brake is ON. The auxiliary brake and aggressive down shift shall engage when you let off the accelerator and shall reset after the accelerator is applied.

One (1)
13-15-1613

The transmission shall down shift to 3rd gear.

One (1)
13-15-4100

FAST IDLE SWITCH

A fast idle switch shall activate an engine high idle. The circuit shall be wired through the neutral safety/parking brake interlock to prevent activation when the transmission is in the road mode. Fast idle shall be set at 1000 RPM's. A switch located inside the cab convenient to the driver shall be provided for this system.

One (1)
13-15-5010

LUBRICATION NAMEPLATE

A nameplate shall be installed that specifies the quantity and type of the following fluids used in the vehicle and tire information:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump priming system fluid, if applicable
- Drive axle(s) lubrication fluid
- Air condition refrigerant
- Air conditioning lubrication fluid
- Power steering fluid
- Cab tilt mechanism fluid

- Transfer case fluid
- Fuel
- Diesel Exhaust Fluid
- Windshield Washer Fluid
- Auto Lubrication System lubricant, if applicable
- Equipment rack fluid, if applicable
- Foam system lubricant, if applicable
- Generator system lubricant, if applicable
- Aerial Hydraulic Fluid, if applicable
- Front tire size and cold pressure
- Inter tire size and cold pressure, if applicable
- Rear tire size and cold pressure
- Trailer tire size and cold pressure, if applicable
- Maximum tire speed ratings
- Ambient operating temperature
- Paint colors and codes

A layer of Velvet Polycarbonate shall overlay the lettering to protect it. The lubrication nameplate shall be installed on the interior face of the driver's door, near the hinge and below the window controls.

One (1)
20-00-550A

STAINLESS-STEEL FULL TILTING CAPITOL CAB

The cab shall be designed specifically for the fire service and shall provide roll cage strength and safety. The cab shall be made in the factory of the bidder and must be the bidder's top-of-the-line stainless-steel model. The cab shall be of the open interior design. The entire cab shall tilt forward 45 degrees for engine access. In order to provide the strongest, safest cab design possible, no extrusions shall be used in the construction of the cab structure. No plastic or fiberglass shall be used in the construction of the cab sub-frame, floor assembly, front assembly, side assemblies, back wall assemblies or roof assembly.

FRONT CAB DIMENSIONS

The front face of the forward cab shall measure 68" from the center of the front axle. The cab shall have an inside width of 91" and outside width of 96".

CREW CAB DIMENSIONS

The back wall of the cab shall measure 68" from the center of the front axle. The cab shall have an inside width of 91" and outside width of 96".

CAB MOUNTING

A four-point mounting system shall be provided. The mounting system shall consist of two (2) front pivot mounts fabricated of steel and two (2) rearward lock plates attached to the rear cab sub-structure. Each front pivot mount shall consist of a greaseless pin and a multi-layered, self-lubricating, composite bearing.

The outer layer of the bearing shall be high-durometer rubber to isolate road vibrations and shock. Each rear lock plate assembly shall consist of two hydraulic actuated locks isolated from the chassis by center bonded rubber mounts.

SUB-FRAME

The sub-frame shall be stainless-steel reinforced welded safety-cage construction utilizing a 3" x 4" rectangular structural steel tube sub-frame. All joints shall have continuous welds; stitch welding shall not acceptable. The sub-frame shall be designed as a one-piece structure from the front to the back of the cab. It shall be used to support the cab while tilting, join front pivots to the cab locks, and to join the cab to the chassis. Pocketing of the sub-frame shall not be acceptable.

FRONT ASSEMBLY

The safety-cage section at the front of the cab shall be constructed of 1.25" stainless-steel tubing and shall join the front door posts together with the main sub-frame. There shall be a 2.50" x 1.50" x .25" heavy wall lower cross tube that joins the cab sills together to prevent cab twisting when tilting the cab. The front fire walls shall be set back from the front assembly structure to provide added protection in a frontal crash. The outer cab skin shall not be an integral structural member, although it shall help stiffen the cab front face.

The front cab door hinge mount (aka "A" pillar) shall be a 2" x 2" tube with a .19" thick wall.

CAB FLOORS

All floor components shall be welded directly to the sub-frame. The floor shall be constructed of 50,000 psi stainless-steel. Cab floors shall be covered with a sound barrier mat with a heavy-duty wear surface.

SIDE WALL ASSEMBLIES

The safety-cage on the sides shall be constructed of 1.25" stainless-steel tubing. Both side wall assemblies shall be joined to the sub-frame via thick tubular structures, using heavy fillet welds. This shall strengthen the walls to withstand high roof loading. The side wall outer skins shall be integral with the cab structure as well as additional formed components to help stiffen side wall assemblies. There shall be 1.25" of insulating foam between the exterior and interior side walls. The structure shall be reinforced for cab entry grab handle mountings.

The rear cab door hinge mount (aka "C" pillar) shall be equivalent to a 2.5mm formed channel with .19" thick tapping bar.

ROOF ASSEMBLY

The 1.25" stainless-steel tubing used in the construction of the roof section of the safety-cage shall support 2 psi of loading across the whole roof. The fabricated and welded roof sills and front header shall be made of 50,000 psi stainless-steel material. The corner caps shall utilize spun metal technology thus retaining the metal's strength while producing a very rigid corner joint. The side roof covering (rolled edges) shall be constructed of stainless-steel formed in a quarter round.

It shall form a hollow double wall, angle reinforced roof edge with an integral drip rail. The roof top outer wall shall not be an integral structural member, although it shall stiffen the roof. There shall be 1.25" of insulating foam between the exterior roof and interior ceiling.

One (1)
20-00-68B1

OVERLAY ON BACK OF CAB

A brushed stainless-steel overlay shall be provided over the entire exterior rear wall of the cab. The overlay shall have a vertical grain direction.

One (1)
20-00-6930

CAB ENGINE COOLING INTAKE GRILLE

The cab front opening shall be covered with a custom made polished stainless-steel grille fabricated at the bidder's factory. The grille shall have vertical bars spaced apart on 2-1/4" centers. The upper polished stainless-steel grille shall have a stainless-steel matching lower counterpart to further facilitate engine cooling.

One (1)
20-00-6995

CAB ENGINE COOLING INTAKE PROTECTIVE SCREEN

The engine charged air cooler and radiator shall be protected by a stainless-steel screen located between the cab mounted front grill and the engine CAC and radiator. The stainless-steel screen shall have 1/2" x 1/2" openings and shall protect the entire cab grille opening area.

One (1)
20-00-69MX

ENGINE AIR INTAKE GRILLE WITH WATER/EMBER SEPARATOR

A highly polished stainless-steel removable grille for engine air intake shall be provided. The air intake grille shall contain the replaceable water and ember separator filter in an integral housing.
The air intake grille and water/ember separator cartridge shall be located on the side of the cab, above and to the rear of the driver's side steer axle. The engine air intake grill shall be no less than 60" above the ground.

One (1)
20-00-741S

FLAT ROOF

A flat roof shall be provided with an interior floor to ceiling height of 59".

One (1)
20-00-74CB

CAB ROOF COMPARTMENT

A compartment approximately 61.00" wide x 36" long x 12" High shall be installed on top of the cab roof, flush with the rear. The compartment shall be constructed of .125" aluminum treadplate and shall have a full length 3/16" hinged treadplate cover with 2-gas cylinder assists and 2-butterfly latches. The box will be mounted on 1/4" angles to space off of the cab so the water can drain off of the cab roof.

The compartment shall be weather tight. There shall be two 8" rubber covered handles installed on the rear face of the cover.

A 30" x 24" piece of smooth aluminum painted job color shall be provided on top of the box for vehicle identification.

One (1)
20-00-78A1

PAINTED CAB ROOF

The exterior surface of the cab roof shall be painted in compliance with the cab paint specifications detailed elsewhere in this specification document.

One (1)
20-00-821C

CAB DOOR CONSTRUCTION - BARRIER CLEARING

The forward and crew cab doors shall be barrier clearing and fabricated from stainless-steel (No exceptions). The forward and crew cab doors shall be 34.5" wide.

The interior and exterior door handles to be flush mounted paddle style with a Trimark TM202 keyed lock incorporated in the exterior handle and lever control lock incorporated in the interior handle. One (1) key per door shall be provided. The crew cab doors shall not include a taper and maintain full width from top to bottom for maximum crew entry and exit access.

The door check straps shall be six (6) inch wide 9800 lb. woven nylon strap with sewn integral steel reinforcement bars for attachment to cab and cab door. The door's latch locking mechanism shall make it impossible to lock oneself out of the cab unless locked with the supplied key. The door rotary latch mechanisms latch linkage shall be accessible through an access panel integral to the interior door panel. Doors shall be hung on stainless-steel full-length hinges attached to cab and door with .25" bolts. The hinges for each door shall be of one-piece 304-2B stainless-steel construction with stainless-steel pins and 0.090-gauge leaves with 2" joints and a 3" width opening. Doors shall meet Federal Motor Vehicle Safety Standard #206. The doors shall be designed so as to allow the tempered laminate windows to roll completely down.

Entrance step wells to the driver's and officer's positions shall be a minimum of 26" wide. Entrance step wells to the crew cab positions shall be a minimum of 34" wide. Entrance steps shall be made of stainless-steel grating.

One (1)
20-00-8425

The front cab doors shall open minimum 90 degrees.

One (1)
20-00-8450

The rear crew cab doors shall open minimum 90 degrees.

One (1)
20-00-850C

CAB TILT

The cab shall tilt a minimum of 45 degrees for normal servicing of the engine and other equipment.

The tilt cab locking system shall be a two-point type that locks automatically when the cab is lowered into its nested position. The cab tilt package is custom designed for safety and ease of vehicle maintenance. The hydraulic tilting system consists of two (2) heavy-duty single acting cylinders. The power supply is a high efficiency electric over hydraulic system with an integral mechanical override in case of battery failure. All components and parts are designed for installation with a minimum of 3 to 1 safety factor based on current S.A.E. standards.

In addition to the velocity fuses, a secondary safety system shall be provided to hold cab in the fully raised position in the event of a failure in the primary lift mechanism. It shall consist of a metal channel device, which automatically drops over the extended rod of the right-side hydraulic lift cylinder thereby preventing its retraction. The safety channel can only be released through an overt action made by the operator such as pulling a lever or cable from the right side of the apparatus, near the safety channel. Automatic release of the safety system shall not be acceptable.

The cab tilt system shall be remotely controlled utilizing a fifteen-foot cable with a handheld push button device. If barrier doors are selected, then the cab tilt control shall be located, stored, and tethered directly to a compartment beneath the officer side floor, forward step well area. The compartment shall have a hinged door with a latch.
The door shall have the same finish as the surrounding step well area. If full length doors are selected, then a port shall be provided on the side of the cab forward of the officer's door hinge and the control/whip shall be removable.

Remove cab tilt instruction label from the front bumper and install the label only (no backing) to the outside face of the officer's seat riser.

One (1)
20-00-9100

AUXILIARY ENTRANCE STEPS

Auxiliary cab entrance steps shall be provided at each cab door opening, below the cab, to reduce the cab entrance step height by approximately 9.5 inches.

One (1)
20-00-952C

CAB SIDE ACCESS DOOR

Two (2) stainless-steel cab side access doors shall be provided on the cab, one each side, to the rear of the front cab entrance doors. Door openings shall be approximately 13.00" wide x 40.00" high. The doors shall fit flush with the exterior skin of the cab and be hung on 304 stainless-steel full-length hinges attached to the cab and door by 0.25" bolts. The doors shall open a minimum of 90 degrees.

One (1)
20-00-960B

The cab side access doors shall be vertically hinged at the rear edge.

One (1)
20-00-960F

The doors shall each have a chain style door stay; chains shall allow the doors to open past 90 degrees.

One (1)
20-00-960P

The "D" handle type latches shall be provided on the lower part of the door.

One (1)
20-00-961L

KEYED LOCKS

There shall be keyed locks for both the cab side access doors. The driver's side and officer's side access doors shall be keyed alike with #1250 keys.

One (1)
20-00-966B

CAB SIDE ACCESS DOOR LOWER INNER FLANGE PROTECTORS

Brushed stainless-steel lower inner flange protectors, approximately .50" wide, shall be provided on the cab side access door to protect the painted finish.

One (1)
20-00-SA10

FRONT GRILLE SCRIPT NAMEPLATE

A "Seagrave" nameplate, fabricated from AISI 304 stainless-steel, with mirror finish, shall be located on the lower front engine cooling intake grille of the cab.

Two (2)
20-01-0120

SIDE ACCESS DOOR SCUFF PLATES

Brushed stainless-steel scuff plates shall be provided on the inside of two (2) cab side access door(s) to protect the painted finish.

One (1)
20-05-2020

FRONT ALUMINUM INNER LINERS

Semi-circular inner liners shall be provided in each front wheel housing. They shall be constructed of aluminum and shall be bolted in place so they may be removed if damaged. Self-tapping sheet metal screws are not acceptable. The outside edge of the inner liner shall be bolted along its entire length. The bottom edge of liner shall not have a formed reinforcement flange to avoid trapping dirt and debris.

One (1)
20-05-2110

FRONT FENDERETTE

Polished stainless-steel fenderettes shall be installed in the front wheel openings. They shall be sufficiently wide to completely cover the front tire and reduce wheel splash along the sides of the cab. They shall be installed with 1/4" hex head bolts (self-tapping sheet metal screws are not acceptable) and have a full width rubber welt placed between the fenderette and body wheel well opening flange. Outside edge of welting shall form a "V" bead between fender and cab side face to prevent moisture from entering. Inside edge shall also have a small, raised bead. Outside edge of fenderette, at the wheel opening shall be rolled inward to eliminate a sharp edge and avoid injury when cleaning apparatus.

One (1)
20-07-010R

FRONT MUD FLAPS

Heavy duty mud flaps with the manufacturer's "script and flame logos" placed on the rear face shall be provided and installed to the rear of the front wheels. Flaps shall be 14" wide and be made of 0.38" heavy duty rubber material to prevent "sailing".

One (1)
20-07-020R

REAR MUD FLAPS

Heavy duty rear mud flaps with the manufacturer's "script and flame logo" placed on the rear face shall be provided and installed to the rear of the rear dual wheels. Flaps shall be 24" wide and be made of 0.38" heavy duty rubber material to prevent "sailing".

One (1)
20-10-2500

CONVEX SPOT MIRRORS

A Velvac 6" diameter bolt on convex mirror shall be provided below each of the west coast mirrors.

One (1)
20-10-4000

MIRRORS

Two (2) "Velvac" 2010 stainless-steel heated mirrors with 2-way remote shall be installed, one each side of the cab. The mirror heads shall be West Coast style, flat 7" x 16". Mirrors shall be installed on the cab doors.

One (1)
20-10-4910

The mirrors shall be wired hot off the battery switch.

One (1)
20-12-0300

WINDSHIELD

The windshield shall be of tinted automotive laminated safety plate glass with a curved two-piece design. The windshield shall have approximately 2900 square inches of visual area. Right and left-hand windshield glass shall be symmetrical and interchangeable from side to side to minimize spare parts stock and expense. Windshield shall be installed and held in place by an extruded rubber molding with a bright finish, decorative, locking bead. Cab shall be finish painted prior to windshield glass being installed.

One (1)
20-12-0308

WINDSHIELD WIPERS AND WASHERS

One (1) wet arm operated windshield wiper shall be provided for each plate of windshield glass for accessibility and optimum windshield wiping surface areas. Wipers shall be two speed type with intermittent wiping feature. One (1) control switch shall be provided and located on the self-canceling directional switch for both wiper arms. The switch shall combine the on/off (automatic park position), two speed, intermittent and washer functions in one control.

The turning switch shall activate the wipers and control speed and pushing it shall operate the washers. The wiper arms shall park in a low, horizontal position to provide an unobstructed view when not in use.

One (1)
20-12-031S

WINDSHIELD WASHER RESERVOIR

A five (5) quart windshield washer fluid reservoir shall be provided. It shall be accessed in the officer's step well. A hinged aluminum tread plate door with small D-ring handle shall be provided for access. A visual inspection shall be possible without tilting the cab (NO EXCEPTIONS). The aluminum tread plate door shall be properly labeled.

One (1)
20-12-271S

DOOR WINDOWS

A retractable window with automotive type laminated safety glass shall be provided in all four (4) forward hinged cab doors. All glass shall be tinted. Glass shall slide in stainless-steel side channels with cloth/fiber liners. Rubberized fiber seals shall be located at the bottom of the window opening to prevent water and debris from entering the interior of the door when the glass is up (or down). A seal shall be placed on both sides (interior and exterior) of the glass. The front door glass shall be 23.75" high x 25.75" wide upper and 27.50" wide lower. The rear door glass shall be 23.75" high x 30" wide. The door window openings shall be trimmed on the exterior side with a smooth, black, poly vinyl chloride (PVC) molding

Electric power window regulator shall be manufactured by the Muncy Corporation and shall be the enclosed, sliding flexible shaft, gear type for ease of operation and reliability. The shaft shall enter a vinyl plastic protective sheath whenever it is exposed. A 12-volt electric motor with gear reduction box to slow driven gear rpm and increase power transmission shall be provided. Individual switches shall be provided so that the driver controls the left side forward door window, officer the right side and crew occupants the rear.

Shall be wired battery direct.

One (1)
20-12-2792

DRIVER'S DOOR GLASS SWITCH

An individual switch for the driver's electric door window shall be provided on the driver's dash.

Aftermarket add-on type electric power window conversion devices like the type that replaces the crank arm will not be acceptable.

One (1)
20-12-2796

OFFICER'S DOOR GLASS SWITCH

An individual switch for the officer's electric door window shall be provided on the officer's dash.

Aftermarket add-on type electric power window conversion devices like the type that replaces the crank arm will not be acceptable.

One (1)
20-12-2798

CREW DOOR GLASS SWITCHES

An individual switch for the crew electric door windows shall be provided on the crew doors.

Aftermarket add-on type electric power window conversion devices like the type that replaces the crank arm will not be acceptable.

One (1)
20-12-3000

ADDITIONAL SWITCHES

Three (3) additional switches shall be provided to allow driver to operate all power cab door windows.

Shall be wired battery direct.

One (1)
20-14-111S

CREW CAB SIDE GLASS

There shall be a side window on each side of the cab between the doors. They shall be tinted and be manufactured of automotive laminated safety glass. The curb side window shall measure 23" high x 12" wide. The street side window shall measure 23" high x 12" wide. They shall be installed and held in place by an extruded rubber molding with a chrome plated, decorative, locking bead. The cab shall be finish painted prior to window glass being installed.

One (1)
20-14-2920

CREW CAB WINDOWS TINT

A gray laminate dark privacy tint shall be utilized on all the door and window glass in the crew cab.

One (1)
20-16-9020

CAB DOOR HINGES

The following exterior cab door hinges shall be polished: passenger front left side, passenger rear left side, passenger front right side, passenger rear right side and any cab side access doors present.

One (1)
20-18-030S

CAB HANDRAILS (SURFACE MOUNT) AND GRAB HANDLES

Handrails shall be 1-1/4" diameter extruded aluminum, with rubber inserts.

All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless-steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface on which they are mounted. A drain hole shall be provided in each bottom stanchion.

Handrails shall be installed as follows:

Four (4) 24" handrails shall be installed on the side of the cab, one just to the rear of each cab door.

Grab Handles shall be installed as follows:

Two (2) 6" chrome grab handles shall be provided, one on the inside of each front cab door.

Two (2) 12" rubber covered grab handles shall be provided, one on the inside of each crew cab door.

Two (2) 12" rubber covered grab handles shall be provided, one on the driver's side and officer's side front A-pillar, above the door hinge, to assist in entry to the cab.

Two (2) 12" rubber covered grab handles shall be provided, one on each rear crew door hinged pillar, on the hinged side of the door, to assist in entry to the cab.

One (1)
20-18-1100

ADDITIONAL GRAB HANDLE(S)

One (1) 8" rubber covered grab handle(s) shall be provided and installed in the cab.

Shall be located at the in-process, or shipped loose with the vehicle, dependent upon selected location additional charges may apply.

One (1)
20-20-0100

CRASH TEST

The cab shall be certified for the following tests:
SAE J2420: Cab Over Engine (COE) Front Strength Evaluation - Dynamic Loading - Heavy Trucks
SAE J2422: Cab Roof Strength Evaluation - Quasi Static Loading - Heavy Trucks
ECE Regulation 29: Protection of Occupants of Cab in Commercial Vehicle

Performance Measure:

1. After undergoing each test, the cab of the vehicle shall exhibit a survival space accommodating a 50th percentile male ATD in the median position without contact between the manikin and non-resilient parts for all seating positions.
2. None of the doors shall open during the tests.
3. The cab attachments may be distorted or fractured; however, the cab shall remain attached to the vehicle frame in at least one attachment location.

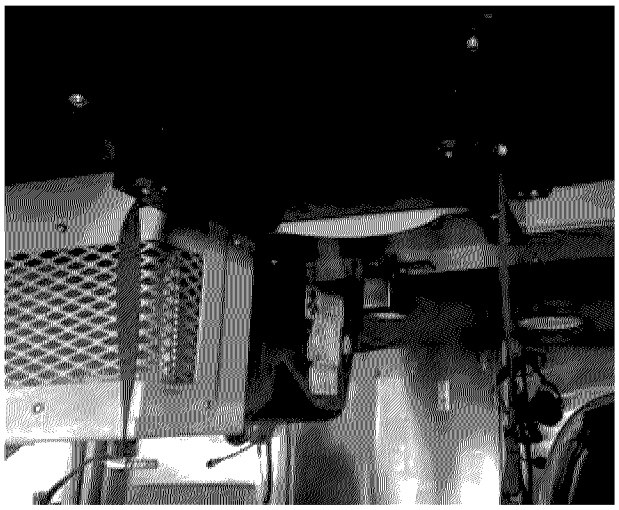
Four (4)
20-20-4010

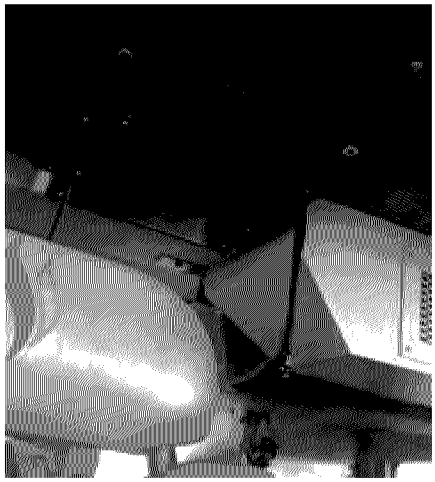
HELMET HOLDER

Four (4) Larsen 07 SEA-LA style single helmet holders shall be provided and installed.
Ceiling mounted holders shall have an aluminum backing plate installed to stiffen the mounting.

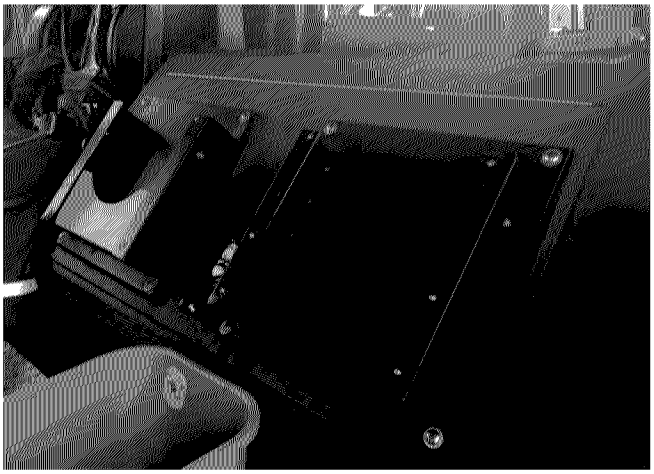
Locations within the cab for the holders shall be as follows:

One (1) located on the cab ceiling, just behind the driver.





One (1) located on the cab ceiling, just behind the officer.



One (1) each side on the access door at the rear of the engine enclosure.

The helmet hold shall be compliant with NFPA 1901 current edition requirements.

One (1)
20-20-4024

CAUTION LABELS

Caution labels shall be posted in the cab so that they shall be visible from each seat position. The labels shall read: "Do Not Wear Helmets While Seated."

One (1)
20-25-080G

HEADLINER

The cab shall be provided with a removable gray headliner for ease of servicing the electrical wiring placed in the cab roof. The headliner shall consist of 3 layers of material. Next to the roof shall be a layer of acoustical insulation made of polyester and polypropylene fibers. The next layer is 1/4" thick Luann. Finally, there is a 1/4" thick layer of foam/perforated acoustical vinyl.

The headliner shall be the multi-piece type (minimum of three (3) sections) so that the entire liner does not have to be removed for localized maintenance.

Shall be modified around the radio box.

One (1)
20-25-0920

BACK LINER

The cab shall be provided with an 16-gauge brushed stainless-steel removable back liner. The back liner shall be the multi-piece type (minimum of three (3) sections) so that the entire liner does not have to be removed for localized maintenance.

Radio and storage box must be only mounted to the center panel, to allow the outer panels to be removed.

One (1)
20-25-094G

HEAD BUMPERS

Two (2) padded gray vinyl head bumpers shall be provided each side on the interior of the cab above the crew doors in the header area.

One (1)
20-25-102G

FRONT CAB ENGINE ENCLOSURE

The engine enclosure structure shall have a 1-1/4" thick inner lining, on the engine side, comprised of aluminized foil and foam/barrier composite for heat insulation. The tunnel cover shall have 1/2" decoupled foam lower and 1" decoupled foam upper covering, on the cab interior side, for noise insulation. The top forward portion of the hood shall have a full-width riser with a sloped face for the installation of the switch panel. The sloped panels shall be used for vehicle accessory controls. A minimum of 1" shall be provided between the right edge of the accelerator pedal and the side of the engine hood. A removable cover over the engine enclosure and insulation shall be coated with dark gray LINE-X to act as an insulator for sound and engine temperature, as well as to provide an easy-to-clean work surface.

ACCESSORY MOUNTING STRUCTURE

The top portion of the engine enclosure shall have a stainless-steel channel frame located between the engine tunnel structure and the cover to support the cover and facilitate mounting of accessories and equipment.

CREW CAB ENGINE COMPARTMENT ACCESS DOOR

An access door shall be provided at the rear of the engine enclosure for routine engine fluid checks. The access door shall be insulated from engine heat with aluminized foil/foam/barrier composite and sealed to prevent exhaust fumes from entering the crew cab.

One (1)
20-25-109A

REMOVABLE TUNNEL COVER OVERLAY PLATE

A removable 9" long x 27" wide x .13" aluminum plate cover shall be provided for access to one (1) space of approximately 7" long x 24" wide beneath the rearmost center tunnel cover immediately to the rear of the center tunnel cover.

The space beneath this access area transitions from 1" to 2" deep in the power point/distribution area for center tunnel accessory potential.

This plate shall be attached directly to the tunnel cover surface and the plate finish shall match the engine tunnel cover.

One (1)
20-25-109E

REMOVABLE TUNNEL COVER OVERLAY PLATE

A removable 27" long x 27" wide x .13" aluminum plate square cover shall be provided for access to two (2) equal spaces of approximately 10" long x 24" wide each beneath the center tunnel cover immediately to the rear of the center dash switch panel area and between the forward cab seating.

This plate shall be attached directly to the tunnel cover surface. Its finish shall match that of the engine tunnel cover.

One (1)
20-25-3000

18" STEERING WHEEL WITH TILT/TELESCOPE

A padded 18" steering wheel with center horn ring shall be provided. The upper steering column shall be of the tilt and telescopic type. A self-canceling directional switch with wiper control and headlight dimmer control shall be mounted on the steering column with an ICC four-way flash switch. The self-canceling directional switch shall be easily removable and replaceable without removing the steering wheel or column assembly. The junction of the shaft and the cab floor shall be sealed to prevent air exchange between the cab interior and exterior.

One (1)
20-25-400G

DARK GRAY LINE-X FOR CAB DASH

The cab dash shall be sprayed with dark gray LINE-X having a high resistance to abrasion and tearing. A vinyl cloth glued or laminated in some manner to a metal backing surface shall not be acceptable.

The LINE-X shall absorb impact without surface damage. The LINE-X shall be resistant to gasoline, diesel fuel, paints, bleaches, organic solvents and other cleaning agents and chemicals.

It shall include sound dampening and vibration elimination properties.

The LINE-X shall be solvent free and be environmentally safe to apply with no VOC or CFC hazards. Its surface shall have a non-glare, granular texture and be easily cleaned with common cleansing compounds.

One (1)
20-25-407G

OVERHEAD DASH

The overhead dash shall have a dark gray LINE-X finish.

One (1)
20-25-4092

DASH RETENTION STRAP

A removable, replaceable limit strap assembly shall be provided to prevent contact with the lower center dash panel and to retain the center overhead dash assembly in an open position when open for inspection or when access to the upper center power distribution is required.

The strap assembly shall consist of a 2" wide, sewn, nylon strap with a steel footman loop inserted in each sewn looped end of the nylon strap. Each of the two (2) footman loops shall be anchored by two (2) 1/4-inch machine screws. The upper anchor assembly shall be attached to the cab roof structure and the lower anchor assembly shall be attached to the hinged power distribution access panel.

One (1)
20-25-4700

FORWARD CAB FLOOR

The forward cab floors shall be covered with a black mat that functions as a sound dampening barrier. The mat shall have a pebble textured heavy-duty wear surface and be laminated to a foam underlay. The mat shall be composed of a vinyl-nitrile blend, which is the base material used in IV tubes and blood bags; it is not affected by blood or other body fluids.

One (1)
20-25-4710

FORWARD CAB FLOOR

Aluminum tread plate flooring shall be installed over insulated forward cab floor matting. Flooring shall be removable in sections and may be notched around floor mounted components. The seams and edges shall be caulked to limit water intrusion beneath the panels.

One (1)
20-25-482A

CREW CAB FLOOR

The crew cab floors shall be covered with a black mat that functions as a sound dampening barrier. The mat shall have a pebble textured heavy-duty wear surface and be laminated to a foam underlay. The mat shall be composed of a vinyl-nitrile blend, which is the base material used in IV tubes and blood bags; it is not affected by blood or other body fluids.

One (1)
20-25-482D

CREW CAB FLOOR

Aluminum tread plate flooring shall be installed over insulated crew cab floor matting. Flooring shall be removable in sections and may be notched around floor mounted components. The seams and edges shall be caulked to limit water intrusion beneath the panels.

One (1)
20-25-500G

SUN VISORS

Two (2) approximately 8" x 28" padded, gray sun visors shall be provided, one on the driver's side and one on the officer's side. Visor shall be supported at both ends to prevent drooping.

One (1)
20-25-8000

VEHICLE DIMENSION SIGN

A sign shall be provided in the front cab area indicating the height of the completed apparatus in feet and inches, length of the completed apparatus in feet and inches, and the gross vehicle weight rating (GVWR) in tons.

One (1)
20-50-5200

INNER DOOR PANELS-BRUSHED STAINLESS-STEEL (4)

The upper inside bolt-on panel on each cab door shall be removable and shall be constructed of brushed stainless-steel. Shall be secured with Truss head bolts (Pan-Head).

One (1)
20-50-6000

All four (4) cab passenger compartment doors shall have at least 96 square inches of reflective material affixed to the inside of each door to alert traffic when the door is open. The reflective material shall be a chevron design that complies with NFPA requirements.

Shall be installed on the crew cab doors, and shipped loose for front, to be installed after delivery.

Noted on statement of exceptions.

One (1)
21-00-B0AE

DRIVER'S SEAT

The driver's seat shall be an H.O. Bostrom Sierra Air-50 reclining high back seat with air suspension. This seat shall have 5" horizontal adjustment.

One (1)
21-01-BSFF

OFFICER'S SEAT

An H.O. Bostrom Tanker 350 SCBA seat shall be provided for the officer. This seat shall have 5" horizontal adjustment.

Redondo Beach Fire Department

Long Beach Spec

One (1)
21-07-020D

The driver's seat shall be held at NFPA regulated height by a 3CR12 stainless-steel frame which creates an enclosed compartment. The compartment measures approximately 18" wide x 6.5" high x 17" deep, front to back at the top and 13.5" deep at the bottom. Access to this compartment shall be through one of the following doors:

One (1)
21-07-041O

The officer's seat shall be held at NFPA regulated height by a 3CR12 stainless-steel frame which creates an enclosed compartment. The compartment measures approximately 18" wide x 11" high x 18" deep, front to back at the top and 10" deep front to back at the bottom. Access to this compartment shall be through a front drop-down door, measuring approximately 8.5" high and 14.5" wide.

One (1)
21-07-091S

The seat riser/compartment shall have a drop downside opening door that measures 9" wide by 4" high.

One (1)
21-07-1000

RISER COMPARTMENT LOCK

The riser compartment shall lock. Two (2) CH751 keys shall be provided, no exceptions.

One (1)
21-07-1000

RISER COMPARTMENT LOCK

The riser compartment shall lock. Two (2) CH751 keys shall be provided, no exceptions.

Two (2)
21-08-0150

Two (2) NFPA compliant IMMI SmartDock Gen 2 SCBA bracket shall be installed in the seat(s). The bracket shall utilize a locking mechanism that engages during deceleration. The bracket shall hold the cylinder in place while in transit and release using no straps, levers, buttons, or switches.

One (1)
21-08-0150

One (1) NFPA compliant IMMI SmartDock Gen 2 SCBA bracket shall be installed in the seat(s). The bracket shall utilize a locking mechanism that engages during deceleration. The bracket shall hold the cylinder in place while in transit and release using no straps, levers, buttons, or switches.

One (1)
21-11-590A

REAR SEATING

The rear crew cab section shall contain two (2) outboard rear facing H. O. Bostrom Tanker 350 SCBA passenger seats. The seats shall be installed one (1) each side at the rear of the engine enclosure. The seating area shall allow maximum room for fire fighters in full turn out gear.

One (1)
21-11-700A

REAR SEATING

The rear crew cab section shall contain two (2) outboard forward-facing seats. The two forward facing seats shall be fold-up jump seats with bottom and back cushions installed on the rear wall of the cab. The seat cushions shall be made by H. O. Bostrom. The seating area shall allow maximum room for fire fighters in full turn out gear. There shall be no logos on the back cushions.

One (1)
21-12-700D

SEAT BELT

The driver's seat shall have a 3-point vertically adjustable D Loop style shoulder harness, to meet FMVSS and NFPA 1901 current edition requirements. The seat belt shall be red in color.

One (1)
21-12-701D

SEAT BELT

The officer's seat shall have a 3-point vertically adjustable D Loop style shoulder harness, to meet FMVSS and NFPA 1901 current edition requirements. The seat belt shall be red in color.

Two (2)
21-12-702D

SEAT BELTS

The two (2) outboard, rear facing seat(s) shall have a 3-point vertically adjustable D Loop style shoulder harness, to meet FMVSS and NFPA 1901 current edition requirements. The seat belts shall be red in color.

Two (2)
21-12-705D

SEAT BELTS

The two (2) outboard, forward facing seat(s) shall have a 3-point vertically adjustable D Loop style shoulder harness, to meet FMVSS and NFPA 1901 current edition requirements. The seat belts shall be red in color.

One (1)
21-12-7160

ELBOW PADS

Two (2) "head bumper style" elbow pads shall be installed on the engine tunnel inboard of the officer and the driver. They shall be covered in vinyl and be attached to the engine tunnel with Velcro. The rear end of the "elbow pad" shall be 26" off from the dash face.

Note: elbow pads may need to be removed in order to access other components.

One (1)
21-12-719G

The color of the elbow pads shall be gray.

One (1)
21-12-7300

SEAT UPHOLSTERY

All cab seats shall be upholstered in gray colored vinyl material.

One (1)
21-13-1510

INTERIOR DÉCOR

The following components shall always be black in color:
Floor matting and floor mat edging
Headliner trim
Back liner trim
Crew heater, complete assembly
Electrical panels
Plastic snap plugs for wire access holes
Door seals
Seat risers
Under seat compartments
Seat belt retractor cover.
Rubber covered grab handles
Map desk if present
Tilt control storage door

One (1)
21-13-2500

CAPACITY SIGN

A sign visible to the driver, which states the number of personnel the vehicle is designed to carry, shall be provided.

One (1)
21-13-7900

SEAGRAVE LOGOS ON SEATS

The Seagrave Logo shall be embroidered onto the following seat locations, unless specified differently: on the headrest if present, or the front of the seat back cushion if not, and one on each side of the seat cushions.

One (1)
21-15-02PW

LOWER COMPARTMENT

Lower Compartment on back wall. Reference Seagrave Part Number, B5436900, Overall width of the compartment to be reduced from 46.50" to 42.00", remaining dimensions 13.50" deep and 7.12 high.

A hinged cover shall be provided hinged to the rear, for proper opening shall be spaced off the rear wall slightly. There shall be three dividers permanent in the compartment, creating three (3) 12.25" openings, and final opening shall be what is remaining within the overall length. The 12.25" wide openings shall start on the driver side openings.

Supports shall be provided on the rear wall to support, they shall be designed to limit interference with the ability to store items under the compartment. The compartment shall be mounted so the bottom is approximately 12" off the floor. This will allow the door to clear the upper compartment.

Part shall be 304 S/S with an exterior DA finish, which shall match the upper compartment. Interior shall be Mill Finish.

One (1)
21-15-03PW

UPPER COMPARTMENT / RADIO COMMUNICATION BOX

A compartment shall be provided on the rear interior cab wall, mounted up high against the headliner, note headliner shall be modified around this compartment.

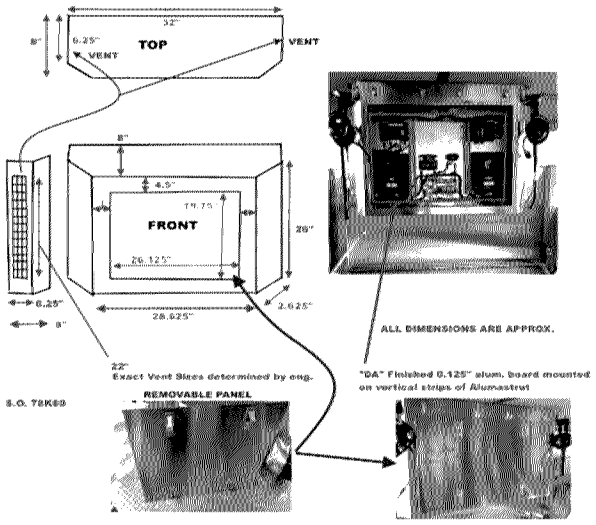
Compartment shall be approximately 32" wide, x 26" high x 8" deep. The side panel flat shall be 6.25", then the forward vertical corners shall be angled 45 degrees, the forward face shall be approximately 28.63" wide. The Upper Header shall be a minimum of 4.5" high.

The forward face shall have an opening approximate dimensions, 26.13" wide x 19.75" high. This opening shall have a removable panel, secured with four (4) compression style latches.

The interior back wall shall have an 1/8" aluminum removable panel, DA finish, Panel shall be mounted on standoffs, attached to the back wall of compartment or cab.

Both outboard faces shall be vented for proper ventilation for radio equipment. Venting shall be 1" x 1" holes, both outboard sides shall have one row across the top and bottom. The bottom of the compartment shall also have 1" x 1" venting. (Disregard image below for venting)

Part shall be 304 S/S with an exterior DA finish, which shall match the lower compartment. Interior shall be Mill Finish



One (1)
21-23-071S

HEATER/DEFROSTER/AIR CONDITIONING-FORWARD CAB

A front cab heater / defroster / air conditioning unit shall be provided. The HVAC unit shall distribute filtered, heated, or cooled, fresh and / or recirculated, air through ducting of the cab front dash panels.

Heating capacity shall be rated at 46,000 BTU minimum.

Cooling capacity shall be rated at 33,000 BTU minimum.

The HVAC unit shall be located in the cab RH firewall and have a variable speed 625 CFM blower assembly. The HVAC unit shall be designed for serviceability and be located behind a removable panel. Access to air intake filter, heater core, evaporator core, and fan assembly shall be provided without removing the HVAC housing from the installed location.

Intake air shall be filtered by a commercially available filter and can be mixed between fresh and recirculated for vent / defrost and heat / cool selections.

Output air can be distributed between the four (4) defroster vent located at the base of the windshield, four (4) rear facing dash vents, and two (2) lower rear facing vents.

Defrost function selection can provide heated or cooled output air, fresh or recirculated intake air, and utilizes the AC system for drying air to the windshield. Output air will be directed through six (6) vents. Four (4) fixed flow vents located at the base of the windshield positioned and designed to distribute the air up. Two (2) adjustable vents located, one (1) at the LH edge of the dash directed at the LH driver's door glass and one (1) at the RH edge of the RH passenger's door glass.

Vent function selection can provide heated or cooled output air, fresh or recirculated intake air. Output air shall be directed rearward through four (4) adjustable vents. Two (2) adjustable vents shall be located in the center dash panel with positioning optimized for LH driver and RH passenger air flow direction to the upper torso. Two (2) adjustable vents shall be located, one (1) each forward seating position, in the upper outboard area of each forward seating kick panel, below the dash.

The front HVAC unit shall utilize a dedicated condenser located on the forward cab roof. The condenser shall be a stacked type, low profile, and feature two fans. All connections, hose, and harness shall be through weatherproof bulkheads. The condenser assembly shall include a white powder coated cover over the stacked condenser coils and a job color painted protective cover over the Freon hoses, dryer, valves, switches and / or solenoids above the cab roof and connected to the condenser body. The main cover shall be repainted job color, matching the cab roof. Condenser and cover mounting shall be made without perforating the cab roof skin for maximum resistance to water intrusion to the cab interior.

One (1)
21-23-381S

AIR CONDITIONING SYSTEM ADDITION - CREW CAB

A crew cab air conditioning unit shall be provided on the cab ceiling, above the rear portion of the engine enclosure. The AC unit shall distribute cooled recirculated, air through six (6) outlets.

The six air outlets include four (4) adjustable rear facing air diffusers and two (2) adjustable side outboard facing vents.

Cooling capacity of the crew AC evaporator unit shall be rated at 39,500 BTU minimum, and the combined cooling capacity of the cab HVAC evaporator units shall be 72,500 BTU minimum.

The crew AC unit shall have a variable speed 577 CFM blower assembly. Intake air shall be filtered by a commercially available and serviceable filter. The AC unit shall feature independent fan speed and temperature controls. Evaporator condensate shall be evacuated by two independent drain hoses, each routed inside a single stainless pipe located beneath the AC unit, between the AC unit and the top of the engine enclosure. The two independent hoses route through the top of the engine enclosure cover, behind the engine block, and terminate outboard the LH chassis frame rail.

The crew AC unit shall utilize a dedicated condenser located on the rear, crew cab roof. The condenser shall be a stacked type, low profile, and feature two fans. All connections, hose, and harness shall be through weatherproof bulkheads. The condenser assembly shall include a white powder coated cover over the stacked condenser coils and a job color painted protective cover over Freon hoses, dryer, valves, switches and / or solenoids above the cab roof and connected to the condenser body. The main cover shall be repainted job color, matching the cab roof. Condenser and cover mounting shall be made without perforating the cab roof skin for maximum resistance to water intrusion to the cab interior.

The air conditioning system, front and rear combined, shall exceed the performance standard of cooling the cab from an ambient temperature of 100 degrees Fahrenheit at 50% relative humidity to an average cab temperature of 75 degrees Fahrenheit in less than 30 minutes.

One (1)
21-23-8020

HVAC CONTROL - FORWARD CAB

HVAC controls shall feature rotary switches, function labeling, backlighting, and have colored indicators. A single, lighted, AC engagement push switch shall be provided for engaging the AC system components as needed.

The HVAC panel shall have four (4) rotary control switches inline, from left to right, in the following order:

· Fan Speed (OFF, LOW, MEDIUM, HIGH)
· Water Temperature Blend Control (HEAT-COOL)
· Outlet Air Blend Control (DEFROST-VENT)
· Intake Air Blend Control (FRESH-RECIRC)

The HVAC panel shall have one (1) raised, "push to engage", switch that illuminates when the air conditioning is engaged. This switch shall be centrally located on the control panel, between the second and third rotary control switches, along the top edge of the control panel.

The HVAC control panel shall allow the operator to make selections or adjustments to any one of the four (4) selectors without resetting or disturbing the selections of other three (3) controls.

The HVAC control shall feature an override to engage the air conditioning system when the operator has selected 100% Defrost on the Outlet Air Blend Control.

Shall be wired hot off the ignition.

One (1)
91-75-0015

WARRANTY

Meritor Corporation provides a two (2) year parts and labor warranty on the front axle.

One (1)
91-75-0020

WARRANTY

Meritor Corporation provides a three (3) year parts and labor warranty on the EX225H disc brakes.

One (1)
91-75-0020

WARRANTY

Meritor Corporation provides a three (3) year parts and labor warranty on the EX225H disc brakes.

One (1)
91-75-0025

WARRANTY

Meritor Corporation provides a two (2) year parts and labor warranty on the rear axle.

One (1)
91-75-003A

WARRANTY

A three (3) year or 300,000 miles parts and labor warranty shall be provided by Meritor WABCO Vehicle Control Systems for the Anti-Lock Braking System (ABS).

One (1)
91-75-004E

WARRANTY

Cummins provides a 5 year or 100,000-mile warranty on the X12 engine.

One (1)
91-75-0065

WARRANTY

Allison provides a 5-year warranty on the EVS transmissions.

One (1)

== Misc. Chas - SFA Chassis - 0.000 ==

One (1)

== 12V Elec - CAP Pumper - 0.000 ==

One (1)
22-00-0105

GENERAL 12-VOLT ELECTRICAL WIRING REQUIREMENTS
12-VOLT ELECTRICAL SYSTEM

The apparatus shall be equipped with a heavy-duty 12-volt electrical system. All 12-volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices. All electrical wiring and components installed in the apparatus shall be suitable for use in severe duty emergency vehicle applications.

GENERAL WIRING AND WIRE HARNESS CONSTRUCTION

Unless otherwise specified by the component supplier, all insulated wire and cable shall conform to SAE J1127 *Low Voltage Battery Cable* type SGX or STX, or SAE J1128 *Low Voltage Primary Cable* type SXL, GXL, or TXL.

Circuit feeder wires shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected.

Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application.

The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures.

The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C) except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

Wiring diagram to be "as built." Electronic Copies.

CIRCUIT IDENTIFICATION

All wiring shall be uniquely identified by a circuit number and color coding. The identification shall be referenced on a wiring diagram. Wires less than 8 AWG shall be permanently identified at least every 2.0 inches (50.8 mm) by a circuit and function code. Cables equal to or larger than 8 AWG and wires included in jacketed cables shall be permanently identified by circuit number at all terminations.

WIRING CONNECTIONS

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer's instructions. Secondary locks shall be utilized on all connectors that are secondary lock capable.

Exterior exposed wire connectors shall be environmentally sealed to withstand elements such as temperature extremes, moisture, and automotive fluids. Seal plugs shall be installed in all unused sealed connector cavities.

All ungrounded electrical terminals shall have covers or be in enclosures to protect against corrosion, excessive heat, excessive vibration, physical damage, liquid contaminants, dust, and other environmental factors.

Wiring splices shall be crimp-type, molded, or sonic weld type. Adhesive lined heat shrink tubing shall be used to seal and insulate splice joints.

WIRE AND CABLE ROUTING

Wiring routed through holes in sheet metal or castings shall have edges protected by an appropriately sized grommet.

Wiring shall be routed to avoid metal edges, screws, trim fasteners, and abrasive surfaces. When such routings are not possible, protective devices (shields, caps, etc.) shall be used to protect the wires. When wires must cross a metal edge the edge shall be covered with a protective shield.

Wiring shall be routed to provide at least 3 inches (76.2 mm) clearance to moving parts, unless positively fastened or protected by a conduit.

Wire routings should avoid areas where temperatures exceed 180° F (82.2° C) and a minimum clearance of 6 inches (152.4 mm) shall be maintained from exhaust system components. Where compliance with this requirement is not possible, high temperature insulation and heat shields shall be utilized.

When wiring is routed between two members where relative motion can occur the wiring shall be secured to each member, with enough wire slack to allow flexing without damage to the wires.

Wiring to all circuit components (switches, relays, etc.) in exposed locations shall provide a drip loop to prevent moisture from being conducted into the device via the wire connection.

Routing wires into areas exposed to wheel wash shall be avoided if possible. When such routings cannot be avoided, adequate clipping or protective shields shall protect the wires from stone and ice damage.

Wiring shall be secured in its intended location with appropriately sized bolt-on clips and nylon wire ties.

Electrical components designed to be removed for maintenance shall include a sufficient length of wire to allow the component to be pulled away from the mounting area for inspection and service work.

Bulkhead type connectors or sealed fittings shall be used to prevent the entry of liquid contaminants into weather tight enclosures.

SPARE WIRES

Wiring harnesses from/to major power and signal distribution areas of the apparatus shall include spare wires for future expansion of the system.

ELECTRICAL SYSTEM COMPONENTS

Serviceable components shall be readily accessible. Switches, relays, terminals, and connectors shall have a dc rating of 125% of the maximum current for which the circuit is protected.

A distributed power and signal system shall be utilized on the apparatus to minimize power supply voltage drops. Power and signal distribution areas in the cab shall be concentrated in five (5) areas.

A lower cab power and signal distribution center shall be located in the center forward portion of the cab "dash". It shall be hinged and opened by unlocking two (2) top mounted, double hinged, lift, and pull latches. This area shall contain relays and circuit breakers installed in a logical and serviceable fashion.

An additional lower cab power and signal distribution center shall be located below the officer's dash behind the kick plate.

An upper power and signal distribution area shall be located in the forward portion of the cab ceiling, above the engine tunnel. Components in this area shall be permanently labeled and easily accessible by opening a hinged cover.

A power and signal distribution area shall be located in the pump module, if applicable. Components in this area shall be permanently labeled and easily accessible.

A power and signal distribution area shall be located on the front of the forward body compartments. Components in these areas shall be permanently labeled and easily accessible.

All electrical components or devices installed in an exposed area on the outside of the cab or body shall be mounted in such a manner, or protected by a gasket, caulking or other means, so that moisture shall not accumulate in it.

CORROSION PROTECTION

Externally exposed, non-plug type, electrical connections shall be given a hand applied or sprayed application of an industrial standard insulation coating with a minimum rating of 2100 volts per mil thickness. Insulation shall protect the connection from water induced electrical corrosion and accidental short circuiting. Should the connection be loosened or removed during the manufacturing process another coating shall be applied after it has been refastened or replaced.

Scuff/Rub protection shall be provided at all locations in the frame and the bulkhead where any electrical line(s) passes through.

One (1)
22-00-0110

MAIN BATTERY AND STARTER CIRCUITS

BATTERY POWER BUSS

All positive cables from the batteries shall be connected directly to a battery positive buss bar located as close to the batteries as practical. The alternator shall be wired directly to the battery positive buss bar through the ammeter shunt if one is provided.

ENGINE STARTER AND INTERLOCK CIRCUITS

The starter solenoid(s) shall be connected directly to the battery positive buss bar. An interlock shall be provided to prevent the operator from engaging the starter when the engine is running.

BATTERY GROUND BUSS AND SINGLE POINT GROUND SYSTEM

All negative (ground) cables from the batteries shall be connected directly to a battery negative buss bar located as close to the batteries as practical. Appropriately sized ground feeder cables shall be utilized to provide a low impedance ground path to the negative buss bar for all electrical devices on the apparatus.

APPARATUS GROUND BONDING

The battery negative buss bar shall be connected to the chassis frame. The cab, pump enclosure (if furnished), and body structure shall be electrically bonded to the vehicle frame with braided copper grounding straps.

One (1)
22-00-0120

EMI/RFI PROTECTION

The apparatus electrical system and related devices shall have the ability to function in the severe electromagnetic environment typical of fire ground operations.

EMI/RFI EMISSIONS

State-of-the-art electrical system design and components shall be utilized to ensure the suppression of radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions that may cause communication and navigation radio-reception interference. The electrical system and related components shall comply with the applicable sections of J551/1 Performance *Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*

EMI/RFI SUSCEPTIBILITY

The apparatus electrical system shall incorporate immune circuit designs, filtering, shielding and twisted-pair wiring to control EMI/RFI susceptibility. Particular attention shall be given to harness and cable routing to minimize the potential for conducted and radiated signal susceptibility.

Electrical / electronic equipment on the apparatus shall not be susceptible to radiated and conducted EMI/RFI emissions from on-board radio transmitter(s) and shall comply with the requirements of SAE J551-12 *Vehicle Electromagnetic Immunity--On-Board Transmitter Simulation.*

One (1)
22-00-0130

ELECTRICAL SYSTEM PERFORMANCE TESTING

An operational test shall be conducted to ensure that all installed electrical equipment is properly connected and is in working order. The apparatus alternator shall be tested with the total continuous electrical load applied and engine running up to the engine manufacturer's governed speed for a minimum of 2 hours. Additionally, all warning lights shall be run continuously during the three (3) hour NFPA pump certification test (or at another time for not less than three (3) hours). Activation of the load management system (if furnished) shall be permitted during this test. An alarm sounded by excessive battery discharge, as detected by the low voltage warning system, or a system voltage of less than 11.8 V dc at the battery for more than 120 seconds, shall be considered a test failure.

One (1)
22-00-014A

CAB DASH AND INSTRUMENTS FOR 2013 EMISSIONS ENGINE

A non-glare instrument panel, custom designed to accommodate the appropriate functions, shall be provided. Illumination shall be provided for controls, switches, instruction plates, gauges, and instruments necessary for the operation of the apparatus. The cab dash shall be forward slanted and constructed of aluminum. Rocker switches that have integral lights shall be as follows when applicable: red indicator lights shall be provided for warning light and engine/mechanical functions, green indicator lights shall be provided for scene and auxiliary lighting and general functions; selection shall be at the manufacturer's discretion.

A system shall be provided that interacts with the engine electronics and eliminates redundant senders and switches. The electronic engine gauges shall receive information on the SAE J1939 data link to improve reliability and gauge accuracy. Connectors shall be utilized for ease of service. The dial face shall be black with white lettering. The primary letters shall be in Imperial with the secondary, smaller letters in metric. The dial shall have international non-language symbols for the gauge function (except speedometer). Gauges shall have illumination with a monochrome LCD display located on the speedometer gauge. They shall also have a 250-degree dial sweep for greater definition of scale. SAE J1939 Faults and Warnings shall be displayed on the LED display.

DRIVER'S INSTRUMENTATION

The following individually mounted gauges shall be provided: (all-inclusive gauge clusters not allowed, no exceptions)

Main Gauges

3" Speedometer:	0-85 mph with built-in LCD display
Speedometer Mode Switch:	Allows operator to select menu items in the display screen
Speedometer Up Switch:	Allows operator to scroll up through display menu items
Speedometer Down Switch:	Allows operator to scroll down through display menu items
3" Tachometer:	0-4000 rpm

Satellite Gauges

2" Fuel Level:	Empty – full with low level warning indicator
2" Voltmeter:	10-16 VDC
2" Coolant Temperature:	100-240 Degrees Fahrenheit
2: Engine Oil Pressure:	0-80 psi
2" Transmission Oil Temp:	100-320 Degrees Fahrenheit
2" Front Air Pressure:	0-150 psi
2" Rear Air Pressure:	0-150 psi
2" DEF Level:	Empty – full with low level warning indicator

DRIVER'S INDICATOR LIGHT MODULE

The following indicators shall be mounted in a removable modular panel in front of the steering column. The indicators shall be identified with universal ISO 2575 symbols where applicable and visible to the driver while seated. All applicable indicators in the modular panel shall automatically illuminate for 1 second upon activation of the ignition switch to verify operation:

Battery Switch "On" green indicator light
Ignition Switch "On" indicator (Seagrave Flame Logo)
Check Transmission amber indicator light
Check Engine amber indicator light
Stop Engine (Engine Warning) red indicator light
High Exhaust Temperature (HEST) amber indicator light (if applicable)
Diesel Particulate Filter Regeneration (DPF) amber indicator light (if applicable)
Wait-to-Start amber indicator light (if applicable)
Malfunction Indicator Light (MIL) amber indicator light (if applicable)
ABS warning amber indicator light
ATC/ESC activated amber indicator light
Spring (Parking) Brake "On" red indicator light
High Beam "On" blue indicator light
Low air pressure red indicator light
Left Turn signal green indicator light
Right Turn signal green indicator light
General Warning red indicator light (if applicable)
DEF Level Indicator Light

AUDIBLE CAB ALARMS

Audible alarms shall be provided in the cab to alert the operator of conditions that require attention. The alarm device(s) shall be audible in the driving compartment and feature an adjustable volume control.

An intermittent audible tone shall sound when the following conditions are present, and the parking brake is disengaged:

Active Hazard Warning –
(Do Not Move Apparatus; Door Open, Tower Raised, Ladder Rack Down, etc.)
Seat Belt Warning

A steady audible tone shall sound when the following conditions are present:

Stop Engine (includes High Engine Temperature and Low Engine Oil Pressure)
Low Voltage
Engine Air Filter Restriction
Jackknife Warning (if applicable)
Tiller Cab Operator Not in Position (if applicable)

DRIVER'S AND OFFICER'S CONTROLS

The following rocker style control switches shall be identified and accessible to the driver while seated. Switches shall include integral indicator lights (where applicable) to advise that the switch has been energized and identification labels shall be illuminated for night driving.

Ignition switch with green indicator light
Engine Start switch
Headlight / Tail-Marker-ID light switch
Instrument Panel Dimmer control rheostat

The following controls shall be stalk mounted on the steering column and identified and visible to the driver while seated:

Turn Signal Control and 4-Way Hazard Warning switch - Wired Battery Direct
High-beam headlight switch
Windshield wiper control switch
Windshield washer control switch

The following controls shall be identified and accessible to the driver while seated:

Parking (Spring) Brake Control
High Idle control switch
Other controls (as defined elsewhere in this specification)

The following controls shall be identified and accessible to both the driver and officer while seated. Controls shall be identified and illuminated for night driving.

HVAC control panel

Other controls (as defined elsewhere in this specification)

One (1)
22-00-015D

EMERGENCY & WORK LIGHT SWITCH PANEL - DRIVER'S SIDE

All emergency light and work area lighting control switches shall be mounted in a removable panel located in the overhead position on the driver's side of the cab. The light switches shall be "rocker" type with an internal indicator light (where applicable) to show when the switch is energized. All switches shall be properly identified by an illuminated label for night driving.

Exact locations shall be determined through the dash layout approval.

City/Freeway Selector Switch - Three position Switch - City Mode/Off/Freeway Mode.

1. CITY/OFF/FREEWAY switch, Switch shall be White in Color, three position with two indicator lights, located per the approved dash layout. – this will operate as follows:

a. FREEWAY MODE – shall activate: Front Solid Reds, Rear Beacons, Rear Lower Amber warning, and electronic siren.

b. CITY MODE – All warning devises.

2. The individual switches will operate the designated warning lights, i.e.. Lightbar, front warn, side warn, rear warn, rear beacon, etc. Switches shall be red in Color, located per the approved dash layout. (as long as the E-Master switch is ON).

3. The individual switches will operate the designated lights regardless of the position of the CITY/OFF/FREEWAY switch.

All warning light switches shall be in the off position.

Work lights are defined as ground, step, rear pick up, hose bed or dunnage area, if on the apparatus and specified.

One (1)
22-00-0160

DOOR AJAR/HAZARD INDICATOR LIGHT (DO NOT MOVE APPARATUS)

A Whelen "T0" series 2" round red flashing LED light with chrome flange shall illuminate automatically whenever the apparatus parking brake is not fully engaged and any of the following conditions exist:

Any passenger or equipment compartment door is open.
Any ladder or equipment rack is not in the stowed position.
Stabilizer system is not in its stowed position.
Powered light tower is extended.

Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

The hazard warning light shall be identified with a label that reads: "Do Not Move Apparatus When Light Is On." The light shall be located on the ceiling between the driver and the officer.

One (1)
22-00-016N

HAZARD WARNING BUZZER

There shall be an audible alarm on the cab dash that shall sound whenever the door ajar/hazard warning indicator is activated. Alarm shall be wired to the parking brake control and work in conjunction with the hazard warning light.

One (1)
22-00-017B

DIGITAL CLOCK

A 24-hour real-time digital clock shall be identified and visible to the driver while seated..

One (1)
22-00-030A

ELECTRICAL WIRING REQUIREMENTS - INTELEX™ PLUS

The apparatus shall be equipped with an INTELEX™ PLUS management system for control of the electrical system devices, where applicable.

CIRCUIT PROTECTION

Circuit protection devices shall be utilized to protect each electrical circuit. All circuit protection devices shall be sized according to 125% of the anticipated load to prevent wire and component damage when subjected to extreme current overload.

SOLID STATE CIRCUIT PROTECTION

Intelex power distribution modules shall utilize solid state output channels and feature fully protected high-side drivers (+12V) to protect wiring. High-side drivers shall provide overload protection, current limitation, transient protection, and replicate the function of an automatic reset circuit breaker. If output current exceeds the rated amperage, the output shall automatically turn off. After 30 seconds, the module shall attempt to re-energize the load. If the output is still overloaded, it shall remain off until the power is cycled. In the event of a communications loss with the vehicle's control module, all outputs not controlling a moving device, such as a ladder rack, shall remain in their previous state until communication is restored, or the power is cycled.

NON-SOLID STATE CIRCUIT PROTECTION

Circuit breakers shall be Type-I automatic reset (continuously resetting) and conform to SAE J553 or J258 unless operational requirements and/or safety concerns dictate Type-III manual reset type conforming to SAE J1625. Automotive-type fuses conforming to SAE J554, J1284, J1888 or J2077 shall be utilized when required to protect electronic equipment.

POWER CONTROL RELAYS AND SOLENOIDS

Power control relays and solenoids shall have a direct current (dc) rating of 125 percent of the anticipated current load.

BUSSMANN MVEC RELAYS AND CIRCUIT PROTECTION

Manufactured as a hardened and weather tight module, the mVEC is rated at 200 Amps. The mVEC is configured to provide various OEM circuit protection and switching functions, using industry standard fuses, relays, and breakers, with the status and control of each circuit accessible through J1939 CAN open messages. Each mVEC is rated at 200 Amps, with individual outputs rated up to 30 Amps. Waterproof to high pressure spraying (IP66 equivalent). The mVEC is designed and manufactured with robust features such as heavy-duty housing, silicon and Gortex gaskets, and protective conformal coated electronics, to operate in demanding vehicle environments such as those found in fire apparatus.

One (1)
22-00-0310

INFORMATION CENTER II

A 5" color display capable of displaying graphical images as well as text messages shall be located on the cab dash. The main display page shall include the date, time, and ambient air temperature in Fahrenheit. Additional information pages shall be provided for the warning indications, not stowed indications, and open doors. The display shall be dimmable with a Rheostat control on the dash and shall have an override button on the control to dim to ten (10) percent.

APPARATUS STATUS INDICATORS AND AUDIBLE ALARMS

If a monitored "Not Stowed" or "Warning" condition is active, the corresponding status indicator shall flash. In addition to visual indicators, audible alarms shall sound when designated conditions activate the "Not Stowed" and "Warning" status indicators.

WARNING INDICATOR

A flashing red triangle symbol shall alert the vehicle occupants of an active "WARNING" condition. This is defined as a situation or status on the vehicle that is of high priority or "mission critical" nature. The flashing red triangle shall be displayed on the Information Center and dash gauge panel in front of the driver. The following are typical "Warning" (high priority) conditions:

HYDRAULIC FILTER	LOAD MANAGE	LOW AIR PSI
CAB NOT LOCKED	LOW VOLTAGE	JACK KNIFE
AIR RESTRICTION	ABS FAULT	TRAILER ABS

NOT STOWED INDICATOR

A flashing Not Stowed indicator shall alert the vehicle occupants of an active "Not Stowed" condition. This is defined as a situation or status on the vehicle that is not of high priority or "mission critical" nature but requires attention before the vehicle is put in motion.

The following are typical "Not Stowed" (not high priority) conditions:

AERIAL RAISED	DECK GUN RAISED	JACKS EXTENDED

The following items are considered Not Stowed only when the parking brake is released.

LADDER UP	JACKS EXTENDED	Q2B TILTED
LIGHT TOWER UP	DECK GUN RAISED	DS TELE LIGHT UP
OUTRIGGERS	STEP DOWN	PS TELE LIGHT UP
DS HATCH OPEN	PS HATCH OPEN	PEDESTAL COVER UP

AUDIBLE ALARMS

The following conditions shall cause the audible alarm to sound "steady" (not an intermittent beep); signifying a "mission critical" condition exists that requires immediate attention.

STOP ENGINE	CAB NOT LATCHED	LOW VOLT
LOW AIR	ABS FAULT	
LOW COOLANT	LOW OIL PRESSURE	

Corresponding "Low Air," "Stop Engine" visual indicators shall be located in the dash gauge panel in front of the driver.

The following conditions shall cause a chime alarm to sound "intermittently" (i.e., beep), once the parking brake is released, signifying a condition exists that may become "mission critical" if not quickly addressed.

ANY LIGHT NOT STOWED
ANY BODY DOOR OPEN
ANY CAB OR CREW CAB DOOR OPEN

An audible alarm shall sound if any of the seat belts are not properly closed, and the vehicle is going 5 mph or greater. The sound shall be different from all other audible alarms in the cab.

OPEN DOORS / DEPLOYED EQUIPMENT RACKS / EXTENDED STEPS

When a cab or compartment door is open, a step is extended, or equipment (i.e., ladder) rack is deployed, the "DOORS" indicator shall flash. Pressing the corresponding button shall display an overhead graphical representation of the apparatus. This image depicts the open cab door(s), open compartment door(s), deployed equipment rack(s), and/or extended step(s). The chime alarm shall also sound when the parking brake is released.

One (1)
22-00-031A

The customer's name and city shall display on the information display screen.

One (1)
22-00-0320

AUTOMATED ELECTRICAL LOAD MANAGEMENT SYSTEM

The apparatus shall be equipped with an automated load management system. The load management system shall monitor battery voltage and activate the engine high idle system (provided NFPA interlocks have been established) before disabling any electrical loads. If engine high idle is not available or activation does not result in sufficient battery system voltage, individual electrical loads shall be automatically and sequentially deactivated until voltage returns to an acceptable level. Loads shall be sequentially reactivated to avoid a sudden large voltage demand on the system. Electrical loads defined in NFPA 1901 as "minimum continuous" shall not be subject to automatic load management. Load prioritization shall be independently field programmable by authorized users.

If the load management system becomes active, the "LOAD MANAGE" indicator shall illuminate on the "Warnings" page of the INTELEX™ PLUS cab mounted display.

No code-3 (emergency) lighting shall be load-managed, Scene lights, including the brow light, shall not be load managed.

One (1)
22-00-0330

LOAD SEQUENCER

A sequential switching device shall automatically energize the specified optical warning devices to minimize potentially damaging voltage fluctuations due to the sudden addition or removal of large current demands on the electrical system. Upon activation of the "EMERGENCY MASTER" warning switch and provided the individual optical warning device switches are also activated, the following loads shall be activated (or deactivated) in 0.5 second intervals:
Front Light Bar
Side Light Bar (if applicable)
Front and Rear Flashing Lights
Side Warning
Rear Beacons
High Beam Headlight Flash

One (1)
22-00-0344

VEHICLE DATA RECORDER AND SEAT MONITOR DISPLAY
Fire Research series SBA200-A00 seat monitor display and vehicle data recorder kit shall be installed. The kit shall include a seat monitor display module, a vehicle data recorder, and cables.

The seat monitor display shall be programmable for up to twelve (12) seats and have a seatbelt icon for each. A message display, push buttons for navigating through programs, and vehicle system warning indicators shall be located on the front of the seat monitor display.

The data recorder case shall be waterproof. It shall have inputs for monitored information from the vehicle J1939 CAN bus, independent sensors, seatbelt and seat occupied switches, outputs for audible alarms, and two-way FRC datalink connectors.

The vehicle data recorder shall record the following data once per second and store it in a 48-hour loop:
Vehicle Speed
Acceleration
Deceleration
Engine Speed
Engine Throttle Position
ABS Event
Seat Occupied Status
Seat Belt Status
Master Optical Warning Device Switch
Time
Date
The vehicle data recorder shall record the following data once per minute and have memory to store it for 100 engine hours:
Maximum Vehicle Speed
Maximum Acceleration
Maximum Deceleration
Maximum Engine Speed
Maximum Engine Throttle Position
ABS Event
Seat Occupied with Seat Belt Unbuckled
Master Optical Warning Device Switch
Time
Date
The oldest data shall be erased first when memory capacity is reached. All data shall be password protected and uploadable from the vehicle data recorder to a computer running FRC HAWK data management software. The HAWK software shall store, manage, provide graphic displays, and produce formatted reports of the vehicle data recorder data.

One (1)
22-00-0350

ELECTRICAL SYSTEM DIAGNOSTICS

The apparatus shall feature on-board electrical system diagnostics and provision for off-board diagnostic service equipment.

ON-BOARD DIAGNOSTICS

On-board diagnostic indicators shall be provided to support rapid troubleshooting of the INTELEX™ PLUS based electrical power and signal system. The input and output status of each INTELEX™ PLUS system module shall be easily determined through easy-to-use display pages.

Switches shall be provided in the cab to allow the operator or service personnel to obtain On-Board diagnostic information from the ABS system and Engine Controller.

A troubleshooting guide shall be provided with the vehicle to assist with interpretation of the diagnostic signals.

OFF-BOARD DIAGNOSTIC PROVISION

An interface port shall be provided for service access to the INTELEX™ PLUS data bus. The diagnostic port shall be mounted inside the cab on the driver side in a location that is accessible from the ground.

One (1)
22-00-0510

POWER STUDS (OVERHEAD SWITCH PANEL)

Four (4) studs shall be provided in the overhead switch panel to provide a 12-volt feed. The studs shall consist of a 12-volt direct stud, switched battery stud, switched ignition stud and grounding stud.

One (1)
22-00-0520

POWER STUDS (CAB DASH)

Four (4) studs shall be provided in the cab dash area to provide a 12-volt feed. The studs shall consist of a 12-volt direct stud, switched battery stud, switched ignition stud and grounding stud.

One (1)
22-00-0530

BUSS BAR

A four (4) stud 30 Amp buss bar shall be provided on the officer side of the tunnel on the angle between the seats, with a cover Linex to match the engine tunnel to provide a 12-volt feed. The studs shall consist of a 12-volt direct stud, switched battery stud, switched ignition stud and grounding stud.

One (1)
22-00-0540

BUSS BAR (UNDER ENGINE TUNNEL)

One (1) four (4) stud 30 Amp buss bar(s) shall be provided under the rear engine tunnel panel to provide a 12-volt feed. The studs shall consist of two (2) 12-volt direct studs, switched battery stud, and grounding stud.

One (1)
22-00-06CP

DASH LAYOUT

The Manufacturer shall furnish a dash layout drawing to the Fire Department for their review and approval. The drawing shall detail the locations for installation of radios, sirens, light switches, gauges, etc. Due to the cab dash configuration and electrical wiring design, the components shall have designated locations that each will fit. The Fire Department shall review and approve the layout during the Engineering Conference.

One (1)
22-01-0210

PUMP ENGAGEMENT CONTROLS AND INDICATORS

A "Pump Engaged" indicator shall be provided in the driving compartment to indicate the pump shift has been successfully completed.

An "OK to Pump" indicator shall be provided in the driving compartment and on the pump operator's panel to indicate that all the following conditions have been met to safely operate the pump in stationary mode:

1. The pump shift is engaged.
2. The parking brake is engaged.
3. If the pump is driven from a transfer case PTO or auxiliary transmission PTO, the drive to the wheels in neutral.
4. If the apparatus is equipped with an automatic transmission, the chassis transmission is in the correct pump gear as follows:
5.

(a) If the pump is driven by a PTO after the chassis transmission gearing (e.g., split shaft PTO, transfer case PTO, etc.) the transmission is in the correct forward drive gear as noted in the shift instruction placard located in the driving compartment.
(b) If the pump is driven by a PTO ahead of the chassis transmission gearing (e.g., flywheel PTO, crankshaft PTO, etc.) the transmission is in neutral.

A "Throttle Ready" indicator shall be provided on the pump operator's panel. The "Throttle Ready" indicator shall indicator when the pump is in "OK to Pump" mode.

One (1)
22-01-0600

AMMETER

A heavy-duty ammeter shall be included with the cab dash gauges. The ammeter scale shall read from -500 amps to +500 amps indicating charging status of the engine alternator.

Two (2)
22-03-1300

12-volt PLUG(S) AND RECEPTACLE(S)

Two (2) 12-volt power plug receptacle(s) and cover(s) shall be provided on the officer's side of the dash and shall be wired battery direct, with a fused circuit. The plug and receptacle are made from corrosion resistant marine grade materials. The plug locks into the receptacle providing a positive moisture proof connection.

The power point shall be located at the outboard lower corner of the center dash panel to the officer's side.

One (1)
22-03-1400

12-volt PLUG(S) AND RECEPTACLE(S)

One (1) 12-volt power plug receptacle(s) and cover(s) shall be provided and shall be wired battery direct, with a fused circuit. The plug and receptacle are made from corrosion resistant marine grade materials. The plug locks into the receptacle providing a positive moisture proof connection.

Location of the 12V Power Point(s) shall be:

One (1) to the right of the driver

Two (2)
22-03-1400

12-volt PLUG(S) AND RECEPTACLE(S)

Two (2) 12-volt power plug receptacle(s) and cover(s) shall be provided and shall be wired battery direct, with a fused circuit. The plug and receptacle are made from corrosion resistant marine grade materials. The plug locks into the receptacle providing a positive moisture proof connection.

Location of the 12V Power Point(s) shall be one each side at rear engine tunnel, in box.

One (1)
22-03-14TC

OUTLET BOX

One (1) outlet box shall be provided on both the driver's side and officer's side of the engine tunnel, on the rearward end, flush with the top surface of the engine tunnel to house USB/12V power at the rear of the engine tunnel. (The power point(s) and USB charger port(s) are not included in this cost). Each aluminum outlet box shall follow the engine tunnel contour and shall have a LINE-X finish to match that of the engine tunnel.

Two (2)
22-03-14UR

USB CHARGER PORT

Two (2) Kussmaul Electronics model 091-219-5-WP USB 2.4/2.4 Amp Dual Charger Ports with weatherproof door shall be wired battery direct with a fused circuit and shall be located on the dash as follows:

Location of USB charger port shall be one each side at rear engine tunnel, in box.

Two (2)
22-03-14UR

USB CHARGER PORT

Two (2) Kussmaul Electronics model 091-219-5-WP USB 2.4/2.4 Amp Dual Charger Ports with weatherproof door shall be wired battery direct with a fused circuit and shall be located on the dash as follows:

Location of USB charger port shall be:

One (1) to the left of the officer.

One (1) to the right of the driver.

One (1)
22-0C-11PW

BACK-UP CAMERA

A 3rd Eye Mobile backup camera, model AWT07MLED1020T, shall be provided and installed on the apparatus. Consisting of a single rear facing camera and a cab interior mounted monitor.

Camera to be mounted under the intermediate step, monitor location to be Zone 9, of the overhead dash.

One (1)
22-10-0700

BATTERIES

Six (6) 12V Group 31 950 CCA batteries shall be installed three each side of the cab under the rear entrance way.

Heavy-duty battery cables shall be provided to maximize power available to the electrical system.

One (1)
22-10-5200

JUMPER CABLE STUDS

A pair of jumper cable studs with color coded covers shall be provided under the driver's side battery storage area.

One (1)
22-11-060S

BATTERY AND ELECTRICAL COMPONENT STORAGE AREAS

Battery and electrical component storage areas shall be constructed of stainless-steel with structural steel tubes at the corner mounting points and shall be located one (1) each side mounted on the vehicle frame. They shall be well ventilated and enclosed to protect against road splash and debris. Suitable provisions shall be provided for drainage.

The batteries shall be held firmly in place by providing a full frame type top clamp which encloses the battery set on all four (4) upper corner sides. The one-piece clamp shall be fabricated of 3/4" angles and be held in place by a minimum of two (2) "J" shaped clamping bolts retained within the battery box to prevent retrieval from underside the apparatus. Battery inspection shall be provided through doors in the step area of the crew cab. Battery replacement shall be possible without tilting the cab (No Exceptions).

One (1)
22-11-0610

The interior of the battery box where the batteries are installed shall be painted gloss black.

One (1)
22-11-5100

BATTERY MATS

The batteries shall be installed on a non-corrosive Turtle Tile mat.

One (1)
22-15-1400

DISCONNECT SWITCH - BLUE SEA 9003

A master load disconnect switch shall be provided between the battery positive buss bar and the remainder of the switched battery electrical loads on the apparatus. A green "battery on" pilot light that is visible from the driver's position shall be provided.

One (1) single battery system switch mounted near the driver's side front entrance in a location so it may be turned off by a person standing on the ground outside the vehicle. It shall have the capacity to handle 350 amps of continuous power.

One (1)
22-15-3750

BATTERY CHARGER

There shall be one (1) Kussmaul model #091-187-12-REMOTE "Auto Charge 1200" single battery charger system installed in the vehicle's electrical system. The charger shall be fully automatic and shall maintain the truck batteries at a full charge level when connected to a 120 VAC source. Remote voltage sensing shall be provided to compensate the charger output for the voltage drop in the charging wires.

DISPLAY

A remote mounted indicator MODEL 091-199-001 shall be included which shall contain one bar graph to display the condition of the batteries. It shall be mounted in the driver's step well above the receptacle.

One (1)
22-15-4LDF

The battery charger/compressor shall be located on the floor behind the driver's seat.

Shall be fore to aft against engine tunnel.

One (1)
22-15-5000

BATTERY CHARGER/AIR COMPRESSOR COVER

A smooth aluminum cover shall be provided over the battery charger/air compressor. The outside finish shall match the cab interior finish.

Cover shall be mounted to the side of the engine tunnel and the floor, maximizing floor space.

One (1)
22-15-5500

PLUG

A 120 volt 3-wire 30 AMP twist lock flanged inlet, L5-30R shall be provided and installed in weatherproof box with spring loaded cover. Shall be a 20 AMP circuit with a 30 AMP Plug and Flanged Inlet.

The inlet receptacle for the battery charger shall be located in the driver's sidestep well. Shall be located rearward in the driver's step well and be properly labeled. The display for the battery charger shall be above the receptacle.

One (1)
22-20-5820

The plug shall be located in the driver's doorstep well.

One (1)
22-20-58WH

The cover shall be white.

One (1)
22-90-0025

UPPER RAISED BEZEL SURROUNDS, WITH PANELS

A custom raised and chrome plated bezel shall be installed on the front face of the cab, on each side of the front grille. Housed within each bezel shall be a removable panel, painted job color. The removable panel shall provide service access to the forward side, firewall mounted electrical connections and wiring harness.

One (1)
22-90-0035

LOWER RAISED BEZEL SURROUNDS, WITH PANELS

A custom raised and chrome plated bezel shall be installed on the front face of the cab, on each side of the front grille. Housed within each bezel shall be a removable panel, painted job color. The removable panel shall provide service access to the forward side, firewall mounted electrical connections and wiring harness.

One (1)
22-90-004J

HEADLIGHTS

Front headlights shall be mounted on the front cab face to the left and right of the engine cooling intake grille. The headlights shall be quad type, rectangular Truck-Lite model 27640C/27645C 12-volt LED with bright finished trim rings and bezels. The low beam headlights shall be located at the outer position.

One (1)
22-90-004Z

The headlights shall be in the lowest position.

The lowest position is not available when a Q2B siren, bell or front suction blocks the light output.

One (1)
22-90-0065

ALTERNATING FLASHING HEADLIGHTS

The chassis high beam headlights shall flash alternately controlled by a rocker switch.

One (1)
22-90-007A

FRONT DIRECTIONAL DUAL LIGHT BEZEL

The front directional lights shall be mounted in a chrome plated dual light bezel located on each side of the cab front face. The dual light bezel shall match the headlight housing.

One (1)
22-90-007X

The front directional light bezels shall be in the uppermost position.

One (1)
22-90-008G

FRONT DIRECTIONAL LIGHTS

There shall be one (1) Whelen M6T LED amber arrow directional signal light installed on each side of the cab front face. The light shall have an amber arrow shape with black background and shall be provided with a "flash" pattern; a "sweep" pattern shall not be allowed. Lens color shall be amber.

One (1)
22-90-0100

CLEARANCE LIGHTS

Exterior cab lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards, and any National Fire Protection Association requirements in effect at the time of proposal.

Five (5) Weldon 9186-1500-20, amber LED type clearance and identification lights shall be surface mounted across the top leading edge of the cab roof.

One (1)
22-90-0140

MARKER LIGHTS

A TecNiq S34 amber LED marker light with amber lens shall be recess mounted in a rubber sealing grommet placed in the lower front cab side, forward of the driver and officer door, on each side of the cab. The light body shall be urethane filled to ensure against moisture intrusion. These cowl mounted lights shall have 100,000-hour life and shall carry a manufacturer's 10-year warranty.

Seven (7) TecNiq S34, red LED marker and clearance lights with red lens shall be installed at the rear of the body. The three light identification cluster shall be surface mounted on the rear step vertical flange. Two lights shall be placed at each lower rear body corner, facing the side. Two lights shall be placed in the upper rear body corners, facing the rear.

One (1)
22-90-031L

TURN/MARKER LIGHTS

One (1) Weldon 9186-8580-20 LED "bug-eye" type turn/marker light shall be provided and installed horizontally on the rear fender panel below the forward air bottle compartment on each side of the vehicle. The lights shall have an amber polycarbonate lens and highly polished stainless-steel mounting flange or bezel.

One (1)
22-90-0400

LICENSE PLATE LED LIGHT & BRACKET

A steel license plate bracket, painted black, shall be installed on the rear of the vehicle on the left-hand side rear body face. Mounted on the license plate bracket shall be a chrome light bracket containing a 12-volt LED lamp that shall illuminate the license plate.

Shall be installed on the rear of the vehicle on the left-hand side rear body face below the LS discharge.

One (1)
22-90-0500

D.O.T. REFLECTORS

Reflectors shall be placed on the cab and body as required by Federal standards. An amber reflector, Signal Stat, model 32ADB, shall be placed on each side of the cab. Four (4) Signal Stat model 32DB red reflectors shall be located on the rear face and sides of the body. The reflectors shall be rectangular in shape.

One (1)
23-02-9010

CAB SIDE DIRECTIONAL LIGHTS

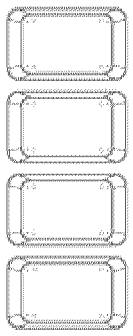
Side directional lights shall be provided in addition to the front turn signals. They shall be Weldon model 9186-8580-20, LED "bug eye" type. One (1) light shall be mounted just above the front fender on each side of the cab. Lights shall have an amber polycarbonate lens and highly polished stainless-steel mounting flange or bezel.

One (1)
23-03-0010

BRAKE/TURN/BACKUP/WARNING LIGHTS CONFIGURATION

The brake, turn, backup and warning lights shall be located at the rear of the apparatus. Each light shall be mounted horizontally in a vertical configuration, one light atop the other.

The order of lights shall be as follows:
Top: Amber Warning
Second from top: Directional
Third from top: Stop
Bottom: Reverse



One (1)
23-03-BWL1

BRAKE/TAILLIGHTS

Two (2) Whelen M6 series LED red brake/taillights, model M6BTT, with red outer lens, shall be mounted at the rear of the apparatus, one on each side. All brakes lights shall be programmed for "steady burn" operation in compliance with FMVSS No. 108.

One (1)
23-03-TWL8

TURN SIGNAL LIGHTS

Two (2) Whelen M6 series Super-LED amber turn lights, model M6T, with amber outer lens, shall be mounted at the rear of the apparatus, one on each side. They shall be provided with a "flash" pattern; a "sweep" pattern shall not be allowed.

One (1)
23-03-VWL8

BACK UP LIGHTS

Two (2) Whelen M6 series clear Super-LED back up lights, model M6BUW, shall be mounted at the rear of the apparatus, one on each side.

Three (3)
23-03-XWB8

BEZELS

Three (3) pair of Whelen #M6FC chrome plated bezels shall be provided for the M6 series rear stop, turn, and backup lights.

One (1)
23-04-021A

REAR PICKUP LIGHTS

Two (2) Whelen Pioneer Micro™ Series Super-LED® work lights, model MPPW, shall be installed at the rear of the apparatus. The 12 VDC, 45 watt 12 LED MPPW shall have a standard 8-degree spotlight lens and have the ability to change the optics with three (3) different flood light pattern lenses provided. The additional lens patterns are 40 degrees x 20 degrees flood, 40 degrees x 8 degrees flood and 90 degrees x 20 degrees flood. There shall be a handle and the housing shall be powder coated white. The light shall be mounted using a stainless-steel pedestal base with a swivel mount.

A switch shall be provided in the cab.

Shall be mounted inboard of the rear beacons on the stanchions.

One (1)
23-04-1160

CAB SPOTLIGHTS

Two (2) white, Golights®, Stryker LED model 30204, shall be mounted to the roof of the cab, one on each side. Lights shall be battery switched. A hardwired joystick dash mount remote shall be installed.

One (1)
23-04-119A

The Golight® shall be positioned all the way forward with regards to the lightbar.

The front corner warning light of the lightbar may be blocked, but this allows the lightbar side and rear corner lights to be visible. Full Golight® operation is provided.

One (1)
23-05-0010

LIGHT ACTIVATION

The cab step lights shall be activated with the cab door open switch.

No step lights shall be interlocked with the park brake/marker.

One (1)
23-05-0035

CAB STEP LIGHTS

Four (4) Whelen model TOCACCCR, LED step lights shall be provided, one (1) at each cab entrance door.

One (1)
23-05-0210

BODY STEP LIGHTS

Four (4) TecNiq Eon, LED horizontal step lights with a polished stainless-steel flange shall be surface mounted, one (1) on each side of the rear step area to illuminate the rear step and one (1) on each side on the forward face of the side compartments.

Shall activate with the Ground light Switch on the Cab Dash and Operator Stand.

One (1)
23-05-2010

LIGHT ACTIVATION

- All Cab Ground Lights shall activate with the opening of any cab door.

- All Ground Lights shall be tied to the three-way switch on the cab dash and operator stand, labeled Ground lights.

- Body/Operator Stand Step Lights Shall activate with the Ground light Switch on the cab dash and operator stand.

- Note the Pump Panel Lights are controlled through the same Ground Light Switch.

- No ground lights shall be interlocked with the park brake/marker.

One (1)
23-05-2111

GROUND LIGHTS

Four (4) weatherproof TecNiq #E10 LED ground lights shall be provided underneath the cab, per NFPA requirements.

Ground lights shall activate with the rocker switches in the cab and on the operator stand.

One (1)
23-05-2121

GROUND LIGHTS

Two (2) weatherproof TecNiq #E10 LED ground lights shall be provided underneath the body rear step, per NFPA requirements.

Ground lights shall activate with the rocker switches in the cab and on the operator stand.

One (1)
23-05-2165

GROUND LIGHTS

Two (2) weatherproof TecNiq E10 LED ground lights shall be provided underneath the pump enclosure, one each side, per NFPA requirements.

Four (4)
23-05-2181

GROUND LIGHTS

In addition to the standard, NFPA required ground lights, four (4) weatherproof TecNiq #E10 LED ground lights shall be provided underneath the vehicle.

Location of the additional TecNiq #E10 LED ground lights shall be: LS1, LS2, RS1, and RS2.

Ground lights shall activate with the rocker switches in the cab and on the operator stand.

One (1)
23-05-301C

ENGINE COMPARTMENT WORK LIGHT

One (1) Whelen 3SC0CDCR engine compartment work light shall be provided. The light shall illuminate the fluid dip sticks. The light shall activate with the cab tilt or with the switch. The single light shall be installed on the right side of the opening.

One (1)
23-05-3105

PUMP MODULE WORK LIGHTS

Two (2) TecNiq E18-WCS0-1 LED lights shall be installed, one (1) on the left side behind the master gauge panel and one (1) on the right side behind the hinged panel. Each light shall have a switch on it.

One (1)
23-05-3185

PUMP MODULE OPEN BIN WORK LIGHT(S)

One (1) TecNiq E10 LED light(s) shall be installed inside the open bin to illuminate the work area. The light(s) shall be mounted on the back wall of the open bin, high up in an area clear of open bin components such as a generator or reel. The light shall be switched with the pump panel lights.

One (1)
23-11-110A

INTERIOR CAB DOME LIGHTS

Four (4) Whelen 60CREGCS 6" round red/clear LED lights with push buttons shall be mounted in the cab ceiling. Two (2) in front (driver & officer) and two (2) in the crew cab. All lights shall be controlled by a switch on the light head.

One (1)
23-11-1410

AUTOMATIC DOOR SWITCHES

Automatic door switches shall be provided for the cab dome lights.

One (1)
23-11-1450

All white dome lights activates with the any automatic door switch.

One (1)
23-11-2150

MAP LIGHT

A Sunnex model HS761-00 pivot and swivel map light with on/off switch, shall be located hanging from the overhead in Zone 7 within reach of the officer.

Two (2)
23-25-0130

EXTERIOR COMPARTMENT LIGHT - LED STRIP(S)

Two (2) exterior compartment(s) shall have a ROM LED lighting strip installed. The lighting strip shall be mounted horizontally on the ceiling next to the door framing in all specified body compartments.

The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door frame, shall be used to activate light.

Specify which compartment(s) shall receive lighting: LS3, LS4.

Eight (8)
23-25-0140

EXTERIOR COMPARTMENT LIGHT - LED STRIP(S)

Eight (8) exterior compartment(s) shall have a ROM LED lighting strip installed. The full height lighting strip shall be mounted vertically along the right side of the door framing (standing outside, facing the inside of the compartment) in all specified body compartments. The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door frame, shall be used to activate light.

Specify which compartment(s) shall receive lighting: LS1, LS2, LS5, RS1, RS2, and RS3. Operator stand compartments.

One (1)
23-25-0150

EXTERIOR COMPARTMENT LIGHTS - (2) LED STRIP(S)

One (1) exterior compartment(s) shall have a ROM LED lighting strip installed on both sides of the door. The lighting strips shall be mounted vertically along both sides of the door framing in all specified body compartments. The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door frame, shall be used to activate the lights.

Specify which compartment(s) shall receive lighting: REAR

Four (4)
23-25-151L

RECESSED COMPARTMENT DOOR LIGHTS

Four (4) additional Whelen # 20C0CDCR LED compartment light(s) shall be provided and recessed into the interior face of all the horizontally hinged lift up compartment door(s) to provide area lighting when they are open. The center of each light shall be located 6" off the hinge side of the door. If two (2) lights per door are chosen, the lights shall be located 8" off the inside edge of the door.

Four (4)
23-25-159Q

The two (2) recessed compartment door lights shall be one on each end of the door.

One (1)
24-10-WFF9

LIGHTBAR

A Whelen Edge® Ultra Freedom™ IV LC series LED 72" lightbar shall be provided on the cab roof, per LBFD requirements.

Redondo Beach Fire Department

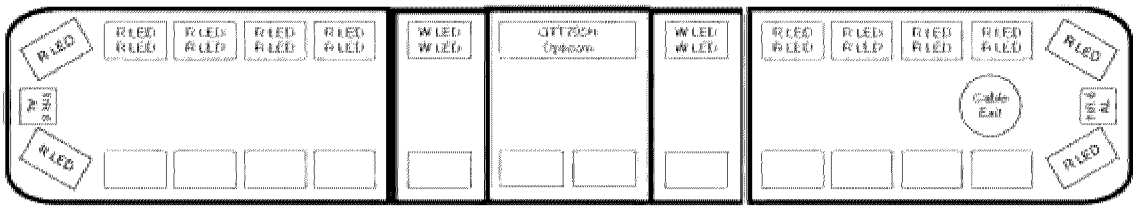
Long Beach Spec

Lightbar consists of four (4) corner Red LED modules, one in each corner. Eight (8) red LED forward facing modules, four (4) each side inboard of the corner modules, Two (2) Clear/White LED modules, one (1) each side outboard of the Emitter. Emitter centered in the lightbar.

The outer lenses are red in color, except where Alley light is, center is clear.

Alley Light shall flash when E-Master is engaged and NFPA Allowed, until overridden with switch (Side Scene). (Also specified in 71-Y0-0010).

Configuration



One (1)
24-15-3022

The Whelen lightbar shall be mounted using a 1.5" high mount, model MKEZ7.

One (1)
24-20-WLB2

UPPER REAR WARNING LIGHTS

Two (2) Whelen model B6M lights shall be provided on the upper rear of the apparatus. The upper level shall consist of a Super-LED® rotator light. The lower level shall consist of an Linear Super-LED® light. The flasher shall have a SignalAlert™ pattern.

Right side shall be Amber Upper, Red Lower, left side shall be Red Upper, Amber Lower. Colored lenses shall be provided.

Two (2)
24-30-WL6X

WARNING LIGHTS

Two (2) Whelen model 6RBRR red Super-LED® ROTA-BEAM™ warning light(s) shall be installed on the apparatus. Red Lens

The flash pattern of the light(s) shall be a variable rate, rotating pattern.

Redondo Beach Fire Department

Long Beach Spec

Two (2)
24-30-WLM1

WARNING LIGHTS

Two (2) Whelen model M6A amber Super-LED® light(s) with chrome plated flange(s) and amber lens(es) shall be provided on the apparatus. The flash pattern of the light(s) shall be Triple Flash, also known as Comet Flash.

Eight (8)
24-30-WLM5

WARNING LIGHTS

Eight (8) Whelen model M6R red Super-LED® light(s) with chrome plated flange(s) and red lens(es) shall be provided on the apparatus. The flash pattern of the light(s) shall be Triple Flash, also known as Comet Flash.

Two (2)
24-30-WLPW

WARNING LIGHTS

Two (2) Whelen model M4R red Super-LED® light(s) with chrome plated flange(s) and red lens(es) shall be provided on the apparatus. The flash pattern of the light(s) shall be Triple Flash, also known as Comet Flash.

One (1)
24-3L-0100

Standard Perimeter Warning Light Locations - Custom Apparatus

Zone A Upper: Front light bars - Freedom Light bar

Zone A lower: Warning lights inboard of turn signals - M6R red Super-LED lights- Steady Burn
Additional warning lights located - Below turn signals centered in upper bezels low position/ Red Rota-Beam LED

Zone B/D lower: Warning lights on side of bumper – M4R red Super-LED lights
Warning lights on side of cab – M6R red Super-LED lights, rear of center near crew door hinge.
Warning lights on body fender – M6R red Super-LED lights

Zone C upper: Rear beacons - B6MMRAP

Zone C lower: Warning lights above directional lights - M6A amber linear Super-LED

One (1)
24-99-F4L0

WARNING LIGHT FLASH PATTERN

The lower rear warning and rear facing of the beacons shall flash in an X-Pattern, utilizing the SYNC Wire.

Two (2)
24-UZ-FLCH

The flange shall be chrome.

One (1)
25-00-0100

AUDIBLE WARNING DEVICES

One (1) automotive electric horn controlled by the steering wheel horn button shall be provided.

One (1)
25-01-0100

BACKUP ALARM

One (1) Preco Model LDA-50 backup alarm shall be provided and activated when the vehicle transmission is placed in reverse. Alarm output shall be a minimum of 97 DBA.

One (1)
25-15-2500

REAR STEP TO CAB BUZZER

There shall be a rear step to cab signal system provided to indicate required truck movement. It shall consist of a buzzer mounted in the cab that shall instruct the driver to go forward, backup or stop. The button that activates the buzzer shall be weatherproof and installed one (1) each side on the rear beavertails, to allow user to remotely alert the driver. The buttons shall be labeled: (1 - STOP) (2 - GO) (3 - BACKUP).

Placed beneath rear handrails one (1) each side.

One (1)
26-00-0020

SINGLE AIR HORN

One (1) Grover E-Tone Stuttertone chrome air horn shall be furnished. A pressure protection valve shall be installed in-line to prevent loss of all air from the vehicle air brake system. The air horn shall range from 18" to 24" in length and shall be as long as possible, dependent upon other selected options and extension length.

One (1)
26-00-005R

The air horn shall be located on the right side of bumper.

One (1)
26-00-0110

AIR HORN SELECTOR SWITCH

An air/electric horn selector switch shall be provided which will allow either the electric or air horn to be actuated by the horn button on the steering wheel.

Shall be Air Down and located per the approved dash layout.

One (1)
26-10-7410

WHELEN SIREN

A Whelen model 295HFS2 remote siren amplifier flush mount head, shall be provided in the cab dash. The siren has a selectable output of 100 or 200 Watts. The microphone shall be hard-wired. The mechanical siren tone shall be programmed to T3.

The cab dash center overhead, Zone 3, shall be widened to accommodate a Whelen #295HFS2 Remote siren head.

The siren head shall be wired battery switched.

Auxiliary activation switches shall only be active when the emergency master and ignition are activated.

Two (2)
26-10-8910

SIREN FOOT SWITCH

There shall be a floor mounted Linemaster® Model 491-foot siren switch to operate the siren. The switch shall be mounted and located as directed. Footswitches shall be wired for the TAP feature.

One (1)
26-10-8Z85

The siren mic clip shall be shipped loose.

Two (2)
26-11-WS30

SIREN SPEAKER(S)

Two (2) Whelen Projector Series SA-315P, 100-watt speaker(s) with Seagrave "Flame" polished grille shall be recess mounted in the front bumper extension.

Two (2)
26-11-Y02C

Both speakers shall be located in the center of the bumper, spaced for Placard to be installed between.

One (1)
26-15-4500

MECHANICAL SIREN

A Federal Signal Model Q2B® siren with chrome plated housing shall be recessed mounted in the front bumper extension with front and vane grille exposed. There shall be an electric brake control installed in the cab, at the driver's switch panel, properly labeled.

Q2B to be wired to the city mode.

One (1)
26-15-462K

The Q2B® siren shall be mounted on the left side of the bumper, forward section extended through the bumper.

Two (2)
26-15-5980

MECHANICAL Q2B® FOOT SWITCH

Two (2) Linemaster® Model 491 momentary foot operated switch(es) to activate the mechanical Q2B® siren shall be installed on the toe board of the cab floor.

One (1)
26-15-598M

Q2B BRAKE SWITCHES

A siren brake switch shall be installed in the cab, at the driver's side and officer's side switch panels, properly labeled. Both are chrome push button, properly labeled.

Two (2)
26-15-7015

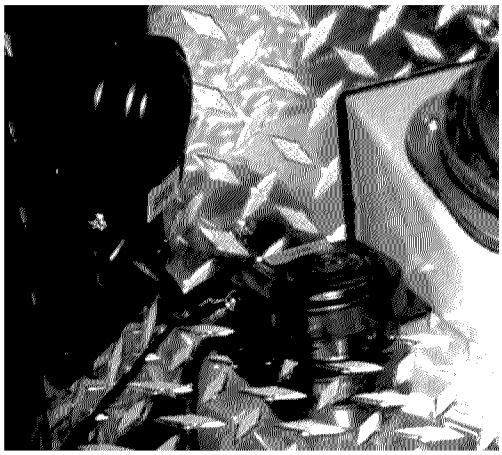
The foot switch shall be deactivated when the parking brake is set.

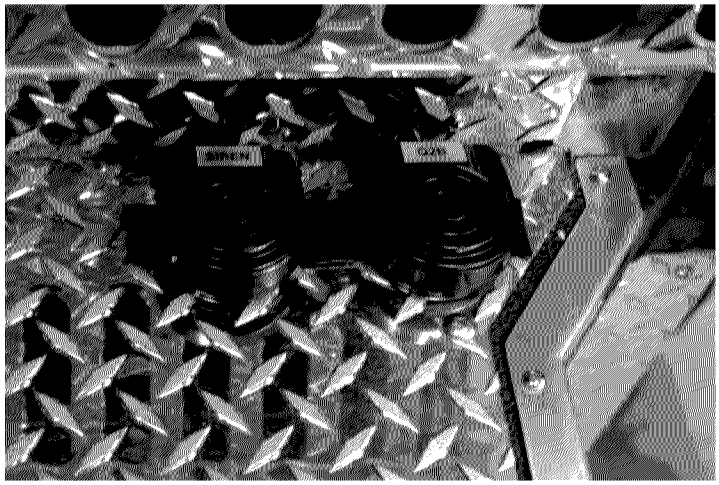
Two (2)
26-15-7015

The foot switch shall be deactivated when the parking brake is set.

Two (2)
26-15-7036

One (1) switch shall be located on the left and right sides. Drivers to be located on angled panel, similar to photo. Officers switch is to be located outboard.



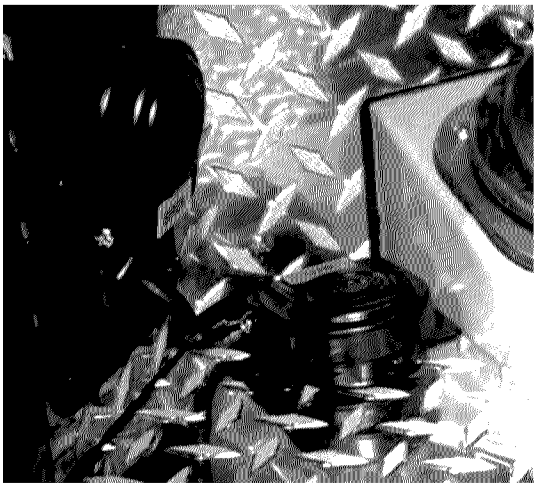


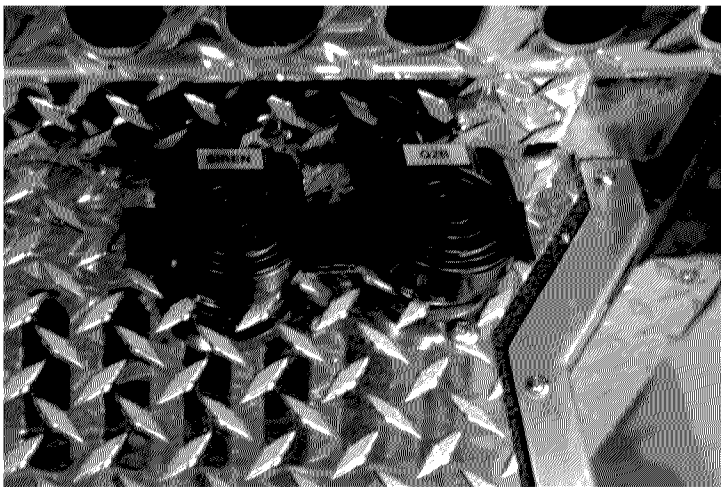
Two (2)
26-15-7036

A foot switch shall be located on the driver's side, and on the officer's side floor. Driver's Side OB & Officer's Side, Outboard Position on Floor, the driver side shall be located similar to photo. Officer side to be located outboard.

Redondo Beach Fire Department

Long Beach Spec





One (1)

== Op. Stand - Custom Side Mt. Pumper - 0.000 ==

One (1)
30-00-0054

Side Mount Operator Stand Shall Be 54" Wide

One (1)
30-00-SLPW

CROSSLAY BED MODIFICATION

The front wall of the crosslay shall be lowered to provide an overall height of 17.00" inside the crosslay beds. An angle shall be installed to support the ATP cover.

One (1)
30-00-SS4A

OPERATOR STAND

A 54" wide modular operator stand with side mount controls, shall be installed between the cab and the apparatus body.

The operator stand shall be independently mounted and furnished with flex joints between the cab and the body to allow for flexure of the chassis frame during road travel. (No exceptions to this requirement). The operator stand substructure shall be fabricated of 304 stainless-steel structural shapes and formed stainless-steel plate and shall also support the side running boards. It shall be installed on the chassis with a four-point isolator arrangement that allows it to flex independently of the chassis frame. A Tech Products rubber isolator shall be used at each mounting point for this purpose. The substructure, including the pump and plumbing shall be removable from the vehicle as one complete unit. The aluminum ceiling of the operator stand shall be fastened with stainless-steel machine screws so that it may be removed for access to the pump and piping as required.

Front of operator stand shall have a DA finish to remove grind marks and weld splatter.

Removable stainless-steel panels, full height, and width shall be provided on both sides of the operator stand and a stainless-steel pump access door shall be provided on each side of the vehicle. Each door shall be hinged along the top and held closed with compression latches or held open with two (2) gas struts.

An 8" aluminum rubber insert grab rail shall be provided on the right and left side of the operator stand, next to the hinged access door on the side of the door next to the crosslay.

CONTROL PANEL

All pump controls and gauges shall be located on the left side of the apparatus on a stainless-steel panel with color coded identification plates.

The following controls and gauges shall be located on the control panel for convenient operation:

- All discharge controls
- Electronic engine throttle or governor
- Primer control
- Tank fill control
- Tank to pump control
- Master discharge gauge
- Master intake gauge
- 1/4" NPT Allen head pressure and vacuum test plugs
- Auxiliary cooler control
- Master pump drain control
- Individual pressure gauges
- Water level indicator

CROSSLAY BEDS

There shall be two (2) crosslay hose beds provided at the top front of the operator stand. The bottom of each crosslay shall be a maximum of 43" from the running board stepping surface. Each hose bed shall have the capacity to carry a minimum of 200 feet of double-stacked pre-connected 1.75" double jacketed hose.

The interior sides of the hose bed shall be constructed of aluminum and shall have a DA finish. The interior of the hose beds shall be smooth and free from all sharp projections which might damage hose.

One adjustable crosslay hose bed partition (divider) shall be provided, constructed of 3/16" thick 5052-H32 aluminum alloy plate. It shall have a DA finish. The divider shall be fully adjustable at each end of the hose bed. The divider shall be held in place by two (2) bolts at each end of the partition's bottom flange.

The bottom of the crosslay hose beds shall be provided with a removable aluminum pan, with ventilation holes, for the stored hose. The pan shall be provided with a DA finish.

OPEN BIN

A 37.63" wide open bin area shall be provided aft of the crosslay beds. The outward facing walls shall be vented as necessary for equipment such as a generator or other device which requires air flow and is located within the open bin.

One (1)
30-02-5095

The walls surrounding the open bin shall be 8.00" high. The floor shall be lowered 4" to an approximate total height of 12", lowering the booster reels.

One (1)
30-02-6020

OPERATOR STAND COMPARTMENT

A stainless-steel construction operator stand compartment shall be provided ahead of the pump on both sides of the operator stand.

Drivers side compartment shall be a minimum of 12" wide and requested to be 28" high, the compartment shall be made to maximize usable space on the panel, and piping layout. The exact size will be determined at the Pump Panel Layout Approval.

Officers side to be approximately 36" high x 12" wide x 12" deep. For Exhaust clearance the floor shall be flat approximately 3-4" then angled upwards for proper clearance. The interior usable from the flat floor to ceiling must be 36. Compartment will not go over the frame, area is to be open for maintenance.

This will allow for more maintenance access when the cab is tilted.

There shall be an 8lb sledgehammer, a 6lb flathead/Halligan irons, and other items to be stored in the compartment. Customer is to ship all items to Seagrave, for reference when designing the compartment.

Both operator stand compartment interiors shall be finished with gray Zolatone type paint following the Zolatone Coat application process.

The interior of the operator stand compartments shall be clear coated following the Zolatone Clear Coat application process in the same components that received a Zolatone application.

Note Shelf (57-05-3030)

One (1)
30-02-7010

OPERATOR STAND EXTERIOR FINISH

Pump panels, on both sides of vehicle and including the gauge panel and inspection doors, shall be brushed stainless-steel. The outward facing exterior stainless-steel surfaces of the open bin, if present, shall also be brushed.

One (1)
30-02-8010

YELLOW PERIMETER LINE

In accordance with NFPA 1901 chapter 15.7.1.6, the perimeter of the open bin floor shall be marked with a one-inch-wide safety yellow line to delineate the designated standing or walking surface area.

One (1)
30-05-54LF

LEFT SIDE RUNNING BOARD WITH HOSE WELL

The left side running board shall be made of 3/16" aluminum tread plate. Two (2) supports shall extend from the operator stand framing to securely support the running board. The outer edges of the running boards shall be double flanged, i.e., formed down and in.

An air space shall be provided between the aluminum running board, the body and the operator stand to prevent moisture and debris from being trapped between these components.

There shall be one (1) hose well recess mounted in the running board. It shall be a minimum of 9" wide x 44.00" long x 9" deep. Black Dri-Dek® shall be provided in the well.

One (1)
30-05-54RF

RIGHT SIDE RUNNING BOARD WITH HOSE WELL

The right-side running board shall be made of 3/16" aluminum tread plate. Two (2) supports shall extend from the operator stand framing to securely support the running board. The outer edges of the running boards shall be double flanged, i.e., formed down and in.

An air space shall be provided between the aluminum running board, the body and the operator stand to prevent moisture and debris from being trapped between these components.

There shall be one (1) hose well recess mounted in the running board. It shall be a minimum of 9" wide x 44.00" long x 9" deep. Black Dri-Dek® shall be provided in the well.

One (1)
30-05-X010

RETAINING STRAP

A two-piece black polypropylene Velcro retaining strap shall be provided for the hose well. It shall be permanently attached on the inboard and outboard side of the trough and shall secure in the center. Looped ends of the strap shall be secured to the apparatus with footman's loops.

One (1)
30-05-X010

RETAINING STRAP

A two-piece black polypropylene Velcro retaining strap shall be provided for the hose well. It shall be permanently attached on the inboard and outboard side of the trough and shall secure in the center. Looped ends of the strap shall be secured to the apparatus with footman's loops.

One (1)
30-06-0W54

PUMP MOUNT BRACKET

A set of mounting brackets shall be used to mount the operator stand and the water pump as one complete module to the apparatus chassis. This system shall be mounted at four points to the chassis frame and shall incorporate flexible isolators to absorb stresses from chassis twisting and vibrations.

One (1)
30-12-0020

PUMP PANEL LABEL COLOR CHART

Color and verbiage shall match the previous order 78J84-89.

One (1)
30-12-0080

PUMP PANEL LAYOUT DRAWING OPTION #1

A drawing showing the layout of the pump panel shall be provided prior to building of the apparatus. The drawing shall include approximate locations of the gauges and control handles as specified.

The layout shall include a view of both sides of the pump house and all applicable controls, gauges, and nameplates.

The layout shall be based as engineered and based upon engineered plumbing layouts.

This layout when released to the customer shall also be released to manufacturing.

NO changes are allowed to the layout.

The pump panel layout shall resemble 78J84-89, as close as possible.

One (1)
30-12-0110

PUMP PANEL LIGHTS

The driver's side of the operator stand shall have three (3) TecNiq E10 LED lights located beneath light shields to illuminate the pump panel controls and gauges. The officer's side shall have one (1) TecNiq E10 LED light beneath the light shield.

One (1)
30-12-0490

PUMP PANEL LIGHT SWITCH

All pump panel lights shall be controlled by three-way switching in the cab and on the pump panel. The switch on the pump panel shall be labeled ground lights.

Pump panel lights shall operate with the ground light switch.

This has been also specified in the ground light section.

One (1)
30-12-1120

CROSSLAY COVER

There shall be an aluminum cover for the crosslay. The cover shall be constructed of 3/16" aluminum tread plate and be hinged with a stainless-steel piano hinge. The cover shall be hinged at the front of the hose bed and shall be provided with a rubber bumper on each end to prevent cover from contacting the cab.

CROSSLAY END FLAPS

A weighted cover shall be provided for the ends of the crosslay hose beds. The covers shall be made of 20 oz. per square yard polyester coated with a urethane topcoat (vinyl). The vinyl covers shall be permanently attached to the ATP cover and have stainless-steel spring clips and stainless-steel hooks on the bottom corners.

This cover combination shall restrain the hose in the crosslay from unintentional deployment while the vehicle is underway in normal operations.

One (1)
30-12-112R

The vinyl end flaps cover shall be red in color. Color number of the vinyl is 705-1064.

One (1)
30-12-1135

HOLD OPEN DEVICE

A hold open device shall be installed on the crosslay aluminum tread plate cover.

One (1)
30-12-2010

YELLOW PERIMETER LINE

In accordance with NFPA 1901 chapter 15.7.1.6, the perimeter of the cover shall be marked with a one-inch-wide safety yellow line to delineate the designated standing or walking surface area.

One (1)
30-12-STEP

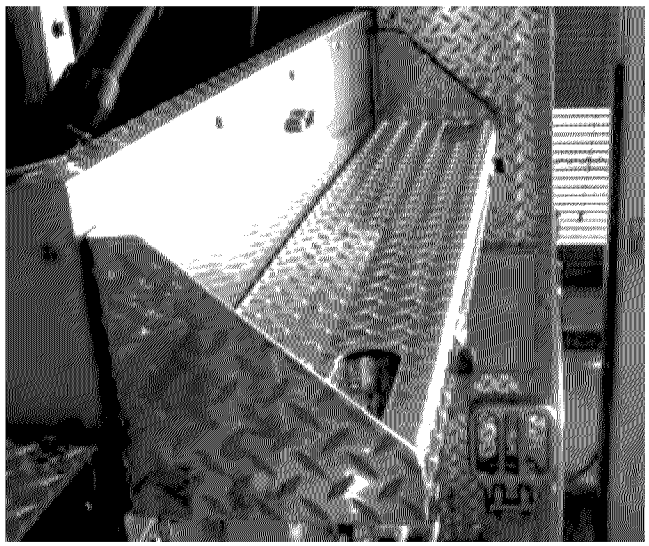
LIGHT SHIELD

One (1) aluminum treadplate gusseted light shield shall be provided, on driver's side of the operators stand. It shall be over the master gauge panel and shall be gusseted to the top of the open bin with aluminum tread plate. It shall be fabricated of 3/16" aluminum treadplate. A Tecniq Eon LED light shall be provided, wired to the Ground Light switch on the cab dash and operator stand.

Does not qualify as a stepping surface per NFPA, the light shield shall be approximately 6" deep,

The light shield shall have two (2) cutouts, slots, one on each end, reference photo. Cutouts shall be used in conjunction with the reel rewind buttons. Knurled Handrails shall be provided behind the cutouts.

Provide and install a "Do Not Step label" on top of the Driver side Light Shield. The hand hold cutouts shall be installed as far forward and rearward as possible.



One (1)
31-00-1400

WATEROUS PUMP

Pump shall be a Waterous CMU two-stage 1500 GPM midship mounted centrifugal type, carefully designed in accordance with good modern practice. The pump shall be tested at the manufacturer's facility and certified by an independent testing organization.

Pump shall be NFPA 1901 current version compliant.

The low-profile split-shaft two-stage series/parallel pump with ball-type transfer valve shall allow the user to switch from pressure to volume smoothly and easily.

Casing:
The casing shall be two-piece, horizontally-split, high-tensile, close grained gray iron. All passageways shall be carefully matched to assure the absolute best hydraulic flow characteristics.

Wear Rings:
The wear rings shall be bronze, reverse-flow, labyrinth-type and replaceable.

Impellers:
Matched bronze impellers shall be balanced both mechanically and hydraulically for vibration-free operation. Flame plated impeller hubs shall be standard to assure longer life despite the presence of abrasives in the water supply.

Impeller Shaft:
The impeller shaft shall be heat-treated stainless-steel that is ground at all critical areas and polished under packing. The two-piece design shall allow for separation of the transmission from the pump without disassembling either component.

Bearings:
Three deep-groove anti-friction ball bearings shall be located outside the pumping chamber to give support and proper alignment to the impeller shaft assembly. The bearings shall be oil or grease lubricated and shall be completely separate from the water being pumped. They shall be protected by seal housings, flinger rings and oil seals.

Flinger Rings:
Flinger rings shall be located on the impeller shaft between the seal housings and bearing housings. They shall provide added protection and keep water and foreign matter out of the bearings.

Transfer Valve:
The ball-type bronze transfer valve shall be in removable bronze housings with large waterways for smooth flow. The valve shall provide a smooth transfer to either PRESSURE or VOLUME without sticking.

Transmission:
The Waterous C20 pump transmission shall have a high-strength, aluminum, three-piece, horizontally split housing, and a high-strength involute form chain drive. It shall have a constant-mesh, two-position sliding collar that engages all teeth simultaneously with an internal locking mechanism to provide a positive lock in PUMP or ROAD position.

One (1)
31-01-0120

PUMP ANTI-CORROSION SYSTEM

An anti-corrosion system shall be installed to prevent galvanic corrosion within the pump. It shall consist of two (2) sacrificial magnesium anodes. One shall be installed on each of the 6" main inlets. Anodes shall be easily removable for inspection and replacement.

One (1)
31-01-0210

PUMP PACKING

Bearings to be protected from water and sediment by stuffing boxes with square graphite rings of packing at each end of impeller shaft. Packing to be held in place by split bronze glands which are fully removable and adjustable. Replaceable bronze wear rings to be provided on the pump.

One (1)
31-01-0530

PUMP SHIFT

An air operated shift system shall be provided that allows the shift arm position to be changed by means of an in-cab mounted switch. It shall engage either the pump drive gear or the truck drive shaft gear. A three-position electric over air toggle switch shall be provided.

All airline fittings to be compression style. NO PUSH LOCK FITTINGS TO BE USED ANYWHERE ON THE APPARATUS, INCLUDING AIR LINES GOING TO THE OPERATOR'S STAND.

One (1)
31-01-0580

PUMP SHIFT MANUAL OVERRIDE

A manual pump shift override shall be provided.

One (1)
31-01-0590

TRANSMISSION LOCK UP

The direct gear transmission lockup for the fire pump operation shall engage when the pump shift control in the cab is activated and the transmission shift is changed to "Drive."

One (1)
31-01-0710

INTAKE PRESSURE RELIEF VALVE

A 2-1/2" Elkhart #40 intake relief valve shall be permanently installed to the pump intake manifold. It shall have minimum pressure adjustment of 75 to 250 PSIG. The surplus water shall be plumbed to the underside of the truck away from the operator.

Locate on the curb side if possible.

One (1)
31-01-079C

The relief valve shall be preset to 150 psi.

One (1)
31-01-0910

TRANSFER VALVE

Transfer valve design shall be of latest ball type, of all bronze construction and incorporate a hydraulically balanced seal assembly to minimize leakage around the ball and assure maximum pump efficiency. The transfer valve shall operate smoothly and without sticking even when exposed to sandy or dirty water. Operation of the transfer valve shall provide smooth changing of the transfer valve to either PRESSURE or VOLUME without shutting down at any discharge pressure up to 250 PSI.

One (1)
31-01-1015

PRIMING DEVICE

Priming pump shall be a Waterous Model VPO electrically driven, positive displacement, rotary vane type. It shall operate without the use of sealing oil, i.e., be of oil-less design and not require an oil tank. Motor shall be totally enclosed to prevent dust, dirt, and water from entering. Priming pump shall be built by the manufacturer of the fire pump.

PRIMING VALVE

Priming valve shall be operated by a push button control on the pump panel. Pushing the button shall automatically open the priming valve and activate the primer motor at the same time, thus being a one hand operation.

PRIMER DISCONNECT

There shall be a primer disconnect switch and fuse located behind the master gauge panel to disconnect power from the primer motor in the event the primer motor "hangs up".

One (1)
31-01-101A

The Waterous primer push button shall be standard size.

One (1)
31-01-1220

PRESSURE GOVERNOR and MONITORING DISPLAY

Fire Research PumpBoss PBA400 series 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 6 3/4" high by 4 5/8". 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 data bus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The following continuous displays shall be provided:
Engine RPM; shown with four daylight bright LED digits more than 1/2" high
Check engine and stop engine warning LEDs
Engine 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
Pressure and RPM operating mode LEDs
Pressure / RPM setting; shown on a dot matrix message display
Throttle ready LED.

A 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 nighttime 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 located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

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 and monitoring pressure display shall be programmed at installation for a specific engine.

One (1)
31-01-2020

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system shall be installed to permit use of water from the discharge side of the fire pump to reduce the temperature of the antifreeze solution circulating through the engine cooling system.

One (1)
31-01-2110

PUMP PIPING –STAINLESS-STEEL, MANIFOLD AND HIGH-PRESSURE HOSE

All suction and discharge lines shall use schedule 10 stainless-steel pipe or heavy-duty pressure/vacuum hose with stainless-steel end fittings. Sweat soldered copper tubing is not acceptable. Where vibration or chassis flexing may damage or loosen piping, the pipe shall be equipped with Victaulic or rubber couplings. All discharge and gated inlet lines to drain through individual drain valves. All individual drain lines are to be extended to drain below chassis frame.

A stainless-steel discharge manifold shall be used to feed the discharges, 2-1/2" or less, as required by the plumbing layout.

All discharge caps on the apparatus 1-1/2" or larger shall be vented (except for the aerial rear inlet/outlet).

All threaded fittings shall be sealed with a heavy-duty Teflon anaerobic pipe sealant. It shall be in a liquid form with a consistency similar to grease. Teflon tape shall not be acceptable. It shall be designed to prevent corrosion between the mating surfaces and to allow for easy disassembly of the joints if necessary. Permabond shall manufacture with a trade name of Permalok.

All water carrying pressure gauge lines are to be of flexible tubing to prevent breakage from vibration.

All suction inlets and discharge outlets shall be equipped with National Standard Threads (NST).

The entire pump and plumbing system shall be tested in accordance with the current version of NFPA 1901.

Thirteen (13) discharges.

One (1)
31-01-2120

MASTER DRAIN - FIRE PUMP

A master drain valve shall be provided and installed. The drain assembly shall be constructed of brass and stainless-steel with individually sealed ports for low point drainage of the fire pump and auxiliary devices.

One (1)
31-01-2130

DRAINS

A Class 1 quarter turn .75" ball drain or bleed off valve shall be provided for each gated hydrant inlet or discharge outlet. The valve shall be mounted in an accessible location. The valve controls shall be properly labeled. The water discharged from the valve lines shall be routed so it is exhausted below the chassis frame rails.

Drain valves may be installed below the running board/body if applicable due to space concerns.

One (1)
31-01-5020

TANK TO PUMP LINE

A 3" tank to pump valve shall be installed between the water tank and the pump. The valve shall be a quarter turn ball type, drop out design and constructed of brass. The control handle shall be chrome push/pull locking "T" type and will be installed on the left side pump panel. A check valve shall be installed between the pump and the valve to prevent water from flowing back into the tank.

One (1)
31-02-0010

INLET AND OUTLET PUSH PULL CONTROLS

Controls for all inlets and outlets shall be push-pull in design, unless otherwise stated at the inlet or discharge option. All inlet and outlet push-pull valve control handles shall be the "T" handle design with a recess in its face for a 7/8" x 2-7/8" identification plate. Handles and panel plates (escutcheons) shall be constructed of cast zinc with a polished chrome plated finish. Handles shall be labeled describing the function of the control handle. The discharge valves that are remote mounted in the pump system piping shall be actuated by the 1/4 turn locking push-pull control assembly. The sliding rod for the outlet which pulls out from the pump panel shall be constructed of 3/4" diameter aluminum with a hard coated anodized surface. The aluminum housing shall incorporate two bronze bushing sleeves. Inlet valve controls do not have to be the locking type nor have the control rod. All controls shall actuate without binding, per the manufacturer's requirements.

One (1)
31-02-0120

ELKHART VALVES

All direct and in-line valves shall be Elkhart "Unibody" swing-out valves. Unibody valves shall have a stainless-steel ball turning in dual self-adjusting seats for bi-directional seating with no O-rings to cut or tear during service. Valves shall be designed for operating pressures to 250 PSI.

If electric valves are chosen, the controller shall be model UBEC1.

Driver side pump panel 2.50" discharges shall be rack and sector.

One (1)
31-02-0330

MASTER GAUGES

A pair of Ashcroft compound gauges shall be provided for the master Pump Intake and master Pump Discharge gauges. The gauges shall be 6" in diameter and have a pressure range of 30-0-600 and shall dampen vibration and pulsation. The gauges shall be the dry type for optimal performance in freezing temperatures. The gauge body and bezel shall be stainless-steel construction with black lettering on white faces. The gauges shall each have an adjustable pointer and a vent hole to assist with condensation.

The master gauges shall be grouped together on the pump operator's control panel for ease of observation during pump operations, as required by NFPA 1901.

Eleven (11)
31-02-0410

PRESSURE GAUGES

Eleven (11) individual line pressure gauge(s) for the 1.50" and larger discharges shall be furnished. The gauge(s) shall be 2.5" in diameter and have a pressure range of 30-0-600 and shall dampen vibration and pulsation. Each gauge shall be the dry type for optimal performance in freezing temperatures. The gauge body and bezel shall be stainless-steel construction with black lettering on white faces. Each gauge shall have an adjustable pointer and a vent hole to assist with condensation.

Gauges are not provided for the booster reels.

One (1)
31-02-1090

FUEL GAUGE

A 2" weatherproof fuel gauge shall be mounted on pump panel indicating the amount of fuel in tank. The gauge shall be mounted in a well-lit area for night operations.

One (1)
31-02-1210

AIR HORN BUTTON

A red momentary push button shall be provided on the operator's pump panel to activate the air horn(s).

One (1)
31-02-2010

WATER TANK LEVEL GAUGE

There shall be a "sight-glass" style water tank level gauge mounted on the pump panel. The tank level gauge shall be a length of clear plastic tubing that is equal in height to that of the booster tank. The tubing shall be mounted on the pump operator's panel in a protective stainless-steel channel. The tubing shall be piped directly into the booster tank and shall fill at a rate, and to a level, which is in direct relation to the water in the booster tank. Tube is backlit blue, and a float ball is provided.

One (1)
33-10-0200

PUMP INLETS

A 6" pump manifold inlet shall be provided on each side of the vehicle. Removable die cast zinc strainers shall be provided in each side inlet to provide cathodic protection for the pump and thus reduce corrosion in the pump. Each inlet shall extend past the pump panel and shall allow a minimum of 10" clearance to the outside edge of the running board.

One (1)
33-10-038D

EXTERNAL VALVES - L/S & R/S MAIN PUMP INLET

A Task Force Tips model AX1SPNX manually operated lightweight aluminum high flow ball gate valve shall be installed externally on both the left side and right-side main pump inlets. The unit shall be equipped with an adjustable pressure relief valve under the main valve body with an eight-position adjustable inlet elbow. The valve shall be controlled with an NFPA compliant slow-close hand wheel gear operator which can be configured for left or right-hand operation. A 3/4" bleeder valve shall be provided to exhaust excess air or water from the valve and hose line. A position indicator shall be provided to allow for quick visualization of the status of the valve in the open, closed or partial positions. For maximum corrosion protection the aluminum casting shall be hard coat anodized, with a powder coat internal and external finish and all components facing the wet side of the valve shall be constructed from stainless-steel.

The connections shall be: 4" Storz rigid with 30 degree swiveling detent elbow and a 6" female NH swivel long handle connection and include polymer bearing strips for prevention of galvanic corrosion. The Storz coupling shall be easily configurable too rigid from swivel. The unit shall be covered by a five-year warranty.

One (1)
33-10-1300

2-1/2" HYDRANT INLET(S)

One (1) 2-1/2" gated hydrant inlet(s) shall be furnished on the left side of the pump enclosure. The valve shall be recessed behind the panel and shall be provided with an Elkhart 418 swing valve control extending through the panel. The valve shall be of the drop out type. Inlet shall terminate with a 2-1/2" NST male adapter and screen.

A chrome plated adapter, from SouthPark Brass with Zinc Screen, #IL35S, 2.5" Female NTP x 2.5 Male NST, shall be provided for the auxiliary inlet valve, a short piece of stainless-steel pipe may be provided for proper clearance.

The Auxiliary inlets shall be equipped with Male NST Threads, items are listed on the statement of Exceptions. NFPA 16.6.3.2 If the intake is 21/2 in. (65 mm) nominal size, the intake shall be equipped with a female swivel coupling with NH threads.

One (1)
33-10-1400

2-1/2 HYDRANT INLET(S)

One (1) 2-1/2" gated hydrant inlet(s) shall be furnished on the right side of the pump enclosure. The valve shall be recessed behind the panel and shall be provided with an Elkhart 418 swing valve control extending through the panel. The valve shall be of the drop out type. Inlet shall terminate with a 2-1/2" NST male adapter and screen.

A chrome plated adapter, from SouthPark Brass with Zinc Screen, #IL35S, 2.5" Female NTP x 2.5 Male NST, shall be provided for the auxiliary inlet valve, a short piece of stainless-steel pipe may be provided for proper clearance.

The Auxiliary inlets shall be equipped with Male NST Threads, items are listed on the statement of Exceptions. NFPA 16.6.3.2 If the intake is 21/2 in. (65 mm) nominal size, the intake shall be equipped with a female swivel coupling with NH threads.

One (1)
33-20-0200

TANK FILL

There shall be a 2" pump to tank fill line installed with a 2" inline valve. Valve shall be controlled at the pump panel with a chrome locking handle.

One (1)
34-16-0010

CROSSLAY DISCHARGES

Two (2) 1.5" discharges shall terminate in the crosslay hose beds. Each shall be plumbed with 2" high pressure hose and/or piping and a 2" ball type brass valve, terminating with a 1.5" NST 90-degree swivel outlet in each hose bed. The valve control for each crosslay discharge shall be installed on the pump operator's panel.

Two (2)
34-20-0250

2-1/2" LEFT SIDE DISCHARGE(S)

Two (2) 2 1/2" discharge(s), each with a pump mounted, quarter turn ball valve shall be located on the left side panel. Each valve shall be capable of being locked or unlocked at the valve from the control panel at any position between open or closed and shall operate freely up to maximum pump discharge pressure.

Both driver's side pump panel 2.50" discharges shall be rack and sector.

Two (2)
34-21-0250

2-1/2" RIGHT SIDE DISCHARGE(S)

Two (2) 2 1/2" discharge(s), each with pump mounted, quarter turn ball valve shall be located on the right-side panel. Each valve shall be capable of being locked or unlocked at the valve from the control panel at any position between open or closed and shall operate freely up to maximum pump discharge pressure. The valve shall be operated from the operator's panel.

One (1)
34-22-0152

1-1/2" LEFT REAR PRE-CONNECT(S)

One (1) 1-1/2" discharge(s) for pre-connected hose shall be located in the left front of the apparatus hose bed. Each shall be plumbed with 2" pipe. Pre-connect shall be gated with a 2" quarter turn ball type, in-line drop out design valve with control located on the pump panel.

One (1)
34-23-0152

1-1/2" RIGHT REAR PRE-CONNECT(S)

One (1) 1-1/2" discharge(s) for pre-connected hose shall be located in the right front of the apparatus hose bed. The discharge(s) shall be plumbed with 2" pipe. Pre-connect(s) shall be gated with a 2" quarter turn ball type, in-line drop out design valve with control located on the pump panel.

One (1)
34-24-0250

2-1/2" LEFT REAR DISCHARGE(S)

One (1) 2-1/2" discharge(s) shall be provided at the rear of the hose bed on the left-hand side. It shall be plumbed with 2-1/2" pipe. The outlet(s) shall be operated by an in-line 2-1/2" drop out type valve with control at the pump panel.

One (1)
34-25-0250

2-1/2" RIGHT REAR DISCHARGE(S)

One (1) 2-1/2" discharge(s) shall be provided at the rear of the hose bed on the right-hand side. Each shall be plumbed 2-1/2" pipe. The outlet(s) shall be operated by an in-line 2-1/2" drop out type valve with control at the pump panel.

One (1)
34-85-0030

MAIN PUMP INLET CAP(S)

One (1) 6" NST long handled chrome plated cap(s) shall be provided for the main pump inlet(s).

One (1)
34-85-0110

LEFT SIDE AUXILIARY GATED INLET CAP(S)

One (1) 2.5" NST chrome plated cap and retaining chain shall be provided for the left side 2.5" auxiliary gated inlet(s).

One (1)
34-85-0120

RIGHT SIDE AUXILIARY GATED INLET CAP(S)

One (1) 2.5" NST chrome plated cap(s) and retaining chain(s) shall be provided for the right side 2.5" auxiliary gated inlet(s).

Two (2)
34-85-1210

LEFT SIDE DISCHARGE ADAPTER(S)

Two (2) 2.5" FNPT x 2.5" MNST chrome plated adapter(s) shall be provided for the 2.5" left side discharge(s).

Two (2)
34-85-1214

LEFT SIDE DISCHARGE ELBOW(S)

Two (2) 2.5" FNST x 2.5" MNST 45-degree chrome plated elbow(s) shall be provided for the 2.5" left side discharge(s).

Two (2)
34-85-1610

RIGHT SIDE DISCHARGE ADAPTER(S)

Two (2) 2.5" FNPT x 2.5" MNST chrome plated adapter(s) shall be provided for the 2.5" right side discharge(s).

Two (2)
34-85-1614

RIGHT SIDE DISCHARGE ELBOW(S)

Two (2) 2.5" FNST x 2.5" MNST 45-degree chrome plated elbow(s) shall be provided for the 2.5" right side discharge(s).

Two (2)
34-85-1930

LEFT SIDE DISCHARGE CAP(S) & CHAIN(S)

Two (2) 2.5" chrome plated cap(s) and retaining chain(s) shall be provided for the 2.5" left side discharge(s).

Two (2)
34-85-2030

RIGHT SIDE DISCHARGE CAP(S) & CHAIN(S)

Two (2) 2.5" chrome plated cap(s) and retaining chain(s) shall be provided for the right-side discharge(s).

One (1)
34-85-210A

LEFT SIDE PRE-CONNECT ADAPTER

One (1) 2" FNPT x 1.5" MNST chrome plated adapter(s) shall be provided for the 1.5" left side front pre-connect(s).

One (1)
34-85-210M

RIGHT SIDE PRE-CONNECT ADAPTER

One (1) 2" FNPT x 1.5" MNST chrome plated adapter(s) shall be provided for the 1.5" right side front pre-connect(s).

One (1)
34-85-2210

LEFT SIDE REAR DISCHARGE ADAPTER(S)

One (1) 2.5" FNPT x 2.5" MNST chrome plated adapter(s) shall be provided for the 2.5" left side rear discharge(s).

One (1)
34-85-2214

LEFT SIDE REAR DISCHARGE ELBOW(S)

One (1) 2.5" FNST x 2.5" MNST 45-degree chrome plated elbow(s) shall be provided for the 2.5" left side rear discharge(s).

One (1)
34-85-2610

RIGHT SIDE REAR DISCHARGE ADAPTER(S)

One (1) 2.5" FNPT x 2.5" MNST chrome plated adapter(s) shall be provided for the 2.5" right side rear discharge(s).

One (1)
34-85-2614

RIGHT SIDE REAR DISCHARGE ELBOW(S)

One (1) 2.5" FNST x 2.5" MNST 45-degree chrome plated elbow(s) shall be provided for the 2.5" right side rear discharge(s).

One (1)
34-85-2933

LEFT SIDE REAR DISCHARGE REDUCER(S), CAP(S) & CHAIN(S)

One (1) 2.5" FNST x 1.5" x 1"NPSH chrome plated adapter(s) with chrome plated cap(s) and retaining chain(s) shall be provided for the 2.5" left side rear discharge(s).

One (1)
34-85-3033

RIGHT SIDE REAR DISCHARGE REDUCER(S), CAP(S) & CHAIN(S)

One (1) 2.5" FNST x 1.5" x 1"NPSH chrome plated adapter(s) with chrome plated cap(s) and retaining chain(s) shall be provided for the 2.5" right side rear discharge(s).

Redondo Beach Fire Department

Long Beach Spec

One (1)
34-90-030M

DELUGE RISER

A 3" deluge gun riser shall be installed above the pump terminating in the open bin with National Pipe Thread (NPT). Location to be determined on the P. E. Drawing and approved by the customer. Piping shall be installed securely so no movement develops when the line is charged. The riser shall be gated and controlled at the pump operator panel. The outlet shall be piped from the discharge manifold of the pump through 3" piping and be gated with a 3" in-line valve. The valve shall be the drop out type and incorporate a slow close control feature.

Piping shall terminate above the pump housing floor approximately 12.5".

One (1)
35-00-0A01

DECK GUN

One (1) Akron Brass Apollo™ model 3423 lift off and direct mount shall be installed on the deck gun discharge. The monitor shall have handwheel elevation control from 90 degrees above to 15 degrees below horizontal with an elevation safety stop at 35 degrees above horizontal; 360 degrees continuous rotation in the deck mode flowing 1250 GPM and 180 degrees in the portable mode flowing 800 GPM; horizontal locking mechanism and stops to prevent accidental over rotation; a full 3" waterway with cast-in turning vanes in each elbow and a 3" NPT or 3" Flange Inlet and a 2-1/2" MNST Outlet. The monitor shall also include a pressure gauge, carrying handle, grease fittings, and be of Pyrolite® construction. Deck height shall not exceed 12', base weight 32 lbs., lift off weight 23 lbs.

The monitor shall be located on-top of the TFT Extend-A-Gun.

One (1)
35-00-0A11

PORTABLE GROUND BASE

One (1) Akron Brass Apollo™ model 3423 portable ground base with two (2) 2.5" NH clappered swiveled inlets shall be shipped loose. The base shall have folding legs with no locking mechanism required to keep the legs in place. The base shall include safety chain and carbide tip ground spikes.

One (1)
35-00-0A21

The monitor shall be Akron Red in color.

One (1)
35-00-0A52

STACKED TIP SET

One (1) Akron Brass model 2499 set of quad stacked tips shall be provided. They shall be constructed of Pyrolite®, have a 2.5" NH slotted female inlet, machined protection rings on the discharge ends, 2", 1-3/4", 1.5", and 1-3/8" recessed orifices for protection, and shall not exceed 16-7/8" in length or 2-7/8" lbs. in weight.

One (1)
35-00-0A63

DISCHARGE PIPE

One (1) Akron Brass model 3488, Pyrolite® discharge pipe- steam shaper shall be supplied. The shaper shall measure 2.5" x 2.5" x 10.5" long and shall be designed with built-in fins.

One (1)
35-00-0APW

MONITOR BASE BRACKET

A Monitor Base Bracket to be provided and shipped loose, Akron #3505.

One (1)
35-00-0T94

TELESCOPING MONITOR PIPE

One (1) Task Force Tips model XG18VL-PL 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 indicator light shall be installed in the information display located in the cab overhead switch panel area.

The aluminum riser shall have a 3" waterway; hard coat anodized finish and be furnished with a 3" Victaulic inlet and a 3" male NPT outlet.

One (1)
35-00-0T9A

EXTEND-A-GUN BRACKET SET

One (1) Task Force Tips model # XGB-33 bracket set shall be provided. The set shall include two saddle brackets and is designed to securely mount the Extend-A-Gun™ telescoping waterway.

One (1)
35-60-0000

NOZZLE CUP

Provide nozzle cups on each side with ½" or larger drain tube. One (1) on each side of operators stand. The nozzle cup holders will be located at the final inspection on the outside of the operator stand. The holders shall be designed with notches to hold pistol grip nozzles.
Reference E1434711, drain tube shall extend to the ground inside the operator stand.

Two (2)
35-70-1100

BOOSTER REELS

A Hannay aluminum booster reel with aluminum discs shall be installed over the pump compartment. Reel shall be constructed utilizing an aluminum welded base. The rewind shall be a 12-volt - 1/2 HP electric motor and will chain drive the reel drum. The booster reel shall have an automatic brake to prevent the booster hose from unwinding uncontrollably. The reels shall have a capacity for 300' of 1" booster hose. A gear driven manual rewind shall be included. The reel shall be piped with 1-1/2" piping and flexible high-pressure hose.

One reel will unwind to the right-hand side and one reel will unwind to the left-hand side.

The reels shall be lowered approximately 4" with the lowering of the open bin floor.

All rewind switches shall be wired battery switched.

Two (2)
35-70-5220

When two (2) reels are selected, one reel shall be on the officer's side and one reel shall be on the driver's side.

Two (2)
35-70-5295

The reel shall be piped with 1-1/2" piping and flexible high-pressure hose. It shall be gated with a 1-1/2" bronze quarter turn ball valve with control located on the pump panel.

Twelve (12)
35-70-6100

50' LENGTH OF 1" BOOSTER HOSE

Twelve (12) 50-foot length(s) of 1", 800 PSI booster hose, coupled with chrome plated pin hole type 1" CHT couplings shall be provided.

One (1)
35-70-6900

HOSE REEL POLISHED S/S ROLLERS & GUIDES - OPEN BIN - BOTH SIDES

Polished stainless-steel hose reel rollers and guides shall be provided in the open bin area on both sides of the apparatus. Placement of the roller and guides shall allow one or two reels in the open bin to be accessed from either side of the apparatus.

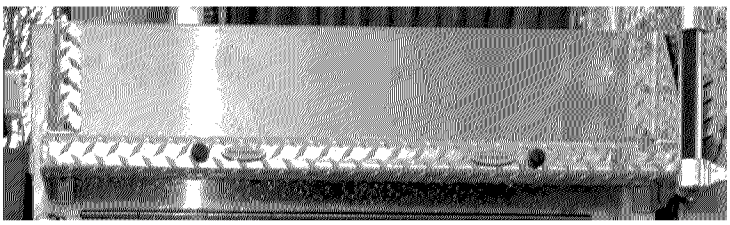
The center roller set shall not be provided.

Two (2)
35-70-6950

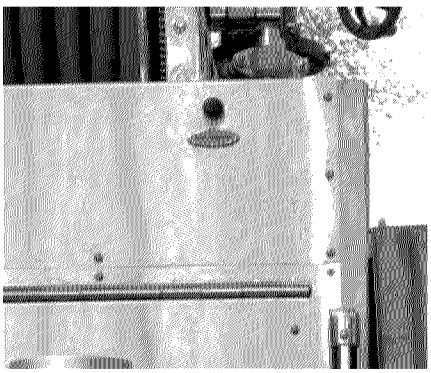
REEL REWIND SWITCH

A Hannay model 90030 push button switch shall be provided at a convenient location on the pump panel for rewinding the reel. A 50-amp master switch circuit breaker shall be located in close proximity to the reel rewind switch on the pump panel.

The driver side shall have two (2) black rubber push button rewind reel buttons shall be on the step light shield, just inboard of the cutouts on the outward facing flange. For the ENG BOOSTER Labels shall be placed inboard of the switch.



The officer side shall have two (2) black rubber push button rewind reel buttons, reference photo and be mirrored to rear of operator stand.



Two (2)
35-70-7400

REEL REWIND SWITCHES

A foot operated reel rewind switch (#632-S) shall be installed on the driver's side and the officer's side in addition to the panel mounted switch.

The switches shall not be available on a pump enclosure with a pull-out step.

One (1)
36-90-5200

FOAMPRO 2002 FOAM PROPORTIONING SYSTEM FOR CLASS "A" OR "B" FOAM

A FoamPro 2002 direct injection foam system capable of flowing 1000 GPM of 0.5% concentration, 500 GPM of 1.0% concentration and 166 GPM of 3% concentration shall be provided.

The foam system shall be capable of discharging either Class A or B foam.

The foam proportioning system operation shall be based on a direct measurement of water flows and pressure. The system shall be equipped with a digital electronic control display on the pump panel.

Incorporated within the control display shall be a microprocessor, which receives input from the system flow meter while also monitoring the foam concentrate output. The microprocessor shall compare the values of the water flow versus the foam flow, to ensure that the proportion rate is accurate.

Push button control for the foam proportioning rate shall allow a ratio from .1% to 3.0% in 0.1% increments. The rated capacity of the system shall be 166 GPM at 3.00% and 1000 GPM at 0.5%.

Foam injection pump shall be rated 5.0 GPM and be the positive displacement type powered by a 12-volt DC electric motor.

A check valve shall be installed between the water pump and foam injection point to prevent foam agent from contaminating the water pump. Also, a check valve shall be placed between the foam pump and injection point to prevent water flowing into the foam pump and foam tanks.

After the flow meter and the foam injection point the discharge shall be split to feed four (4) different outlets. Depending on the number of discharges utilized, nozzle flow rates selected and foam agent percentage, all outlets may not be able to be used simultaneously at rated water or foam flows (see foam capacities stated above) nor can one outlet (of the four) discharge water and another foam while the system is in operation.

One (1)
36-91-0010

FOAM CAPABLE DISCHARGES

Foam shall be plumbed to the following discharges:

Left booster reel

Right booster reel

Rearward crosslay

Right side rear 2.50" discharge

Left Rear 1 1/2" Preconnect

One (1)
36-91-01M2

FOAM PROPORTIONING SYSTEM TESTING

The foam proportioning system accuracy shall be tested using method 2 of section A.20.10.1 as specified in NFPA 1901, current edition: "Measuring Foam Concentrate Pump Output Directly". With the foam system operating at a given water flow rate, and water used as a substitute for foam concentrate, the output of the foam concentrate pump shall be measured by diverting that output into a calibrated container for direct measurement over a measured period of time. An alternative is to measure the water substitute with a calibrated meter.

The contractors report shall contain the following information for each foam tested:

TANK A
Set Ratio:
% and Flow Rate:
GPM to determine Foam Quantity:
Determine Gallons consumed for Run Time:
Actual Mixing Ratio:
% Lower Control Limit:
% Upper Control Limit:
The mixing ratio shall fall within the NFPA specification for accuracy: ___Yes ___No

TANK B_
Set Ratio:
% and Flow Rate:
GPM to determine Foam Quantity:
Determine Gallons consumed for Run Time:
Actual Mixing Ratio:
% Lower Control Limit:
% Upper Control Limit:
The mixing ratio shall fall within the NFPA specification for accuracy: ___Yes ___No

Two (2)
57-00-5200

BRUSHED STAINLESS COMPARTMENT DOOR LINER(S)

Brushed stainless-steel overlay shall be provided on the inside of two (2) compartment door(s) to protect the painted finish and to cover inside door hardware.

One (1)
91-75-0510

EXTENDED WARRANTY

A comprehensive optional Waterous TPP-5 warranty that covers parts for a period of seven (7) years and labor for a period of 5 years shall be provided. See certificate for details.

One (1)
91-75-052E

WARRANTY

Elkhart Brass warrants their Unbody valve series equipment for a period of ten (10) years after purchase against defects in materials or workmanship.

Eleven (11)
91-75-3180

WARRANTY

The Ashcroft gauge(s) shall have a five (5) year manufacturer's warranty.

One (1)
91-75-3180

WARRANTY

The Ashcroft gauge(s) shall have a five (5) year manufacturer's warranty.

One (1)

== Pumper Body OAL - 121" Short - 0.000 ==

One (1)
37-02-0050

T-TYPE WATER TANK

Booster Tank
The Tank shall have a capacity of 500 U.S. Gallons The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the notice is to inform department personnel who store, stock, or use the tank that the unit is under warranty. There shall be a 3" diameter threaded plug located in the bottom of the booster tank sump to provide a drain when cleaning and flushing tank of foreign substances.

Construction
The tank shall be constructed from ½" thick sheet stock material that shall be a non-corrosive stress relieved thermoplastic and U. V. stabilized for maximum protection. The tank shall be of a special configuration and is so designed to be completely independent of the body and compartments. All joints and seams shall be welded and tested for maximum strength and integrity. The top of the tank will be fitted with locations for removable lifting eyes designed with a 3 to 1 safety factor to allow for easy removal. All transverse and longitudinal swash partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are welded to each other as well as to the walls of the tank.

Fill Tower
The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of ½" sheet stock material and shall be a minimum dimension of 8.00" x 8.00" outer perimeter (Standard size to be 12.00" x 12.00"). The fill tower shall be not less than 12.00" high. The tower shall be located in the left front corner of the tank,. The Foam Tank Fill Tower shall be installed inboard the Water Tank Fill Tower. The tower shall have a ¼" thick removable screen and a hinged-type cover. Inside the fill tower shall be a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I. D. of 4" that is designed to run through the tank and shall be piped behind the rear wheels so as to maximize traction. There shall be a 3/4" diameter relief hole provided in the overflow pipe at a point approximately 2.00" above the tank cover line to reduce head pressure.

The fill towers shall be pushed outboard as far as possible to maximize storage area. Must provide clearance for the preconnect pipe, both fill towers shall be installed to the driver's side.

Height of the fill tower shall be lowered to allow the cover to open, in case of over filling the tank, will allow water and pressure to be released. Water fill tower to be 11" x 11" to match previous apparatus.

Cover
The tank cover shall be constructed of ½" thick sheet stock material that is U. V. stabilized. A minimum of two lifting dowels shall be drilled and tapped to accommodate the lifting eyes.

Sump
There shall be one (1) sump standard per tank. The sump shall be constructed of ½" thick sheet stock material and be located in the bottom of the tank to the front. On all tanks that require a front suction, a 3" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" NPT threaded outlet on the bottom for a drain plug. This shall be used as a combination clean-out and drain. The tank shall have an anti-swirl plate located approximately 2" - 2 ½" above the sump.

Outlets
There will be two (2) standard tank outlets: one for tank-to-pump suction line which shall be a minimum of 3" coupling; one for a tank fill line, which shall be a minimum of 1" pipe, NPT coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank and be capable of withstanding sustained fill rates of up to 500 GPM.

Mounting
The tank shall rest on 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 will be decreased to allow for not more than 400 square inches of unsupported area. The tank will be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of .250" x 2.00" and a minimum Rockwell Hardness of 60 durometer. Additionally, the tank will be supported around the entire bottom outside perimeter and captured both front and rear as well as side to side to prevent the tank from shifting during vehicle operation. Although the tank is designed on a free-floating suspension principle, the tank will have adequate hold down restraints to minimize movement during vehicle operation. If proper retention is not available or incorporated into the apparatus hose floor, an optional mounting restraint system shall be located on top of tank, halfway between the front and the rear on each side of the tank. These stops will be constructed of carbon steel having minimum angular dimensions of 3.00" x 3.00" x .250" and shall be approximately 6.00" to 12.00" long. These brackets will incorporate a hard rubber isolating pad with a minimum thickness of .250" affixed on the underside of the angle. The angle will then be bolted to the body sidewalls of the vehicle while extending down to rest on the top outside edge of the upper sidewall of the tank. Internal mounting block design and hose bed floors will 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. Hose floor loading will support up to 200 lbs. per sq. foot and will be evenly distributed whenever possible. Other equipment such as generators, portable pumps, etc. will not be mounted directly to the tank top.

One (1)
37-31-5005

VENT OVERFLOW PIPE-HOSE EXTENSION

Rubber hose shall be connected to the vent overflow pipe on the lower portion of the water tank. This hose shall direct any overflowing water behind the rear axle of the apparatus.

One (1)
37-35-020A

FOAM TANK

A twenty (20) gallon "A" foam tank shall be incorporated into the water tank. These 20 gallons shall be in addition to the amount of water specified. The fill tower shall be a maximum dimension of 8" x 8" outer perimeter. The fill tower shall be provided with an easy opening, hinged, latching cover. Within the fill tower shall be an anti-foaming fill pipe. The fill tower shall be constructed to facilitate complete interior flushing as required. The 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. The fill tower to be installed inboard the Water Tank Fill Tower.

One (1)
40-00-0121

121" OVERALL BODY LENGTH

The overall length of the body shall be 121". The distance from the front exterior edge of the body to the midline of the rear axle shall be 52.5". Body overall width shall be 98", fender to fender.

One (1)
40-00-1100

STAINLESS-STEEL BODY CONSTRUCTION

The body and compartments shall be constructed of heavy duty 3CR12 stainless-steel. The body shall be welded on external or hidden surfaces wherever possible to insure a clean compartment interior look. The compartments shall be a "sweep out" design with the floor higher than the door sill. The compartment floors shall be a minimum of 2.5 mm 3CR12 stainless-steel. All compartment seams shall be caulked with gray adhesive/sealant. Each compartment shall be rated for 500 lbs. of storage. False bulkhead panels shall be provided on the inside of the forward and rearward wall of the side compartment panel to cover and protect all electrical wiring and components. This also provides a clean interior for equipment mounting. These panels shall be removable. Removable service panels shall be placed within each of the false bulkhead panels. Door frames on compartments with hinged doors shall be fabricated by flanging the door opening edges inward 1.88" and bending out again .75" to form an angle. The hose body side panels and partitions shall be raised in 5" increments to provide adequate storage for the required and specified hose load.

A bright aluminum tread plate cover shall be installed over the side compartments. The cover shall not form the compartment top but shall be an overlay. The forward and rearward edges of the cover shall be folded down 1.5" to cap the forward and rearward ends of the side compartment panel. The outside edge of the cover shall be folded down 1.5" to cap the outside of the side compartment panel and shall have a 45-degree outward bend to provide drip protection over any compartment doors which are immediately below the cover. Extruded aluminum drip molding with a bright anodized finish shall provide drip protection for any compartment doors that are not directly below an aluminum tread plate cover. The forward face of the side compartments and the face of the front cross panel above the operator stand shall be covered with a bright aluminum tread plate overlay. All body components covered with aluminum tread plate overlays shall be coated with an anti-corrosion compound prior to installation. All tread plate shall be secured with threaded fasteners.

Fender compartments shall be integral with the body side compartmentation. There shall be no sharp objects protruding into the wheel well area that could cause injury while cleaning or doing other maintenance in this area.

One (1)
40-05-9950

FAMA26 NO-STEP SIGN

In accordance with NFPA 1901 chapter 15.7.1.6, a FAMA26 "No-Step" sign shall be located on the front and rear of the body roof. The sign reads: "Fall Hazard-Railings NOT provided. Surface may be slippery - Not intended for stepping, standing, or walking. Fall will injure or kill"

One (1)
40-10-0010

BODY MOUNTING SUBSTRUCTURE

The front portion of the right and left-hand side compartments shall mount to a front cross panel. The panel shall be constructed of stainless-steel tubing and heavy-duty stainless-steel sheet metal. The front cross panel assembly shall rest on two (2) heavy duty rubber isolators. These isolators shall be bolted to brackets mounted to the chassis frame, as close to the center line of the chassis frame as possible. These center mounted isolators shall provide a pivot point which shall allow chassis movement without introducing stresses into the body. The rear portion of each side compartment shall bolt directly to the rear step support assembly, which is bolted directly to the chassis frame. The rear steel step/body support assembly shall be constructed of formed .25" and .375" plate, 2" X 3" tubes, 2" X 2" angles, and 3" structural channels in a welded assembly. The rear wall shall be reinforced with formed heavy duty panels.

The compartment sizes shall be as follows:

One (1)
45-10-1285

LEFT SIDE COMPARTMENTS

The high over low left-hand side panel at 121.00" long by 70.00" high shall be made of stainless-steel. This panel consists of one (1) low compartment ahead of the rear wheels, one (1) low compartment behind the rear wheels, and two (2) upper compartments. The two upper compartments shall be separated by a doorframe but shall be transverse. The compartment behind the rear wheels has a 25.75" wide x 29.75" high transverse area through the rear tailboard compartment. All compartments shall have hinged doors.

The compartment ahead of the rear wheels shall have a doorframe-to-doorframe dimension of 19.50" wide x 29.75" high. The clear door opening shall be 16.00" wide x 27.75" high. The usable compartment space shall be 19.50" wide x 29.75" high x 25.75" deep. This compartment shall have a vertically hinged single door.

The compartment behind the rear wheels shall have a doorframe-to-doorframe dimension of 31.50" wide x 29.75" high. The clear door opening shall be 28.00" wide x 27.75" high. The usable compartment space shall be 31.50" wide x 29.75" high x 25.75" deep. This compartment shall have a vertically hinged single door.

Each upper compartment shall have a doorframe-to-doorframe dimension of 56.00" wide x 30.50" high. Each clear door opening shall be 52.50" wide x 27.00" high. Each usable compartment space shall be 57.50" wide x 33.00" high x 11.75" deep. Each compartment shall have a horizontally hinged lift-up door.

One (1)
45-20-1805

RIGHT SIDE COMPARTMENTS

The low right-hand side panel at 121.00" long by 36.00" high shall be made of stainless-steel. This panel consists of one (1) low compartment ahead of the rear wheels and one (1) low compartment behind the rear wheels. The compartment behind the rear wheels has a 25.75" wide x 29.75" high transverse area through the rear tailboard compartment. Both compartments shall have hinged doors.

The compartment ahead of the rear wheels shall have a doorframe-to-doorframe dimension of 19.50" wide x 29.75" high. The clear door opening shall be 16.00" wide x 27.75" high. The usable compartment space shall be 19.50" wide x 29.75" high x 25.75" deep. This compartment shall have a vertically hinged single door.

The compartment behind the rear wheels shall have a doorframe-to-doorframe dimension of 31.50" wide x 29.75" high. The clear door opening shall be 28.00" wide x 27.75" high. The usable compartment space shall be 31.50" wide x 29.75" high x 25.75" deep. This compartment shall have a vertically hinged single door.

One (1)
45-27-001L

BEAVERTAIL COMPARTMENT

This stainless-steel compartment aft of the left side compartment behind the rear wheel shall have a doorframe-to-doorframe dimension of 16.00" wide x 63.75" high. The clear door opening shall be 14.50" wide x 61.75" high. The usable compartment space shall be 16.00" wide x 66.25" high x 11.75." This compartment shall have a vertically hinged single door.

One (1)
45-27-0130

BEAVERTAIL COMPARTMENT

This stainless-steel compartment aft of the right-side compartment behind the rear wheel shall have a doorframe-to-doorframe dimension of 16.00" wide x 29.75" high. The clear door opening shall be 14.50" wide x 27.75" high. The usable compartment space shall be 16.00" wide x 32.25" high x 11.75." This compartment shall have a vertically hinged single door.

One (1)
45-38-0100

VENTS

Compartment vents shall be provided to meet the requirements of NFPA 1901, current edition.

One (1)
45-39-0020

REAR ALUMINUM INNER LINERS

Full semi-circular inner liners shall be provided in each wheel housing. They shall be constructed of aluminum and shall be bolted in place so they may be removed if damaged. Self-tapping sheet metal screws are not acceptable. The bottom edge of liner shall be reinforced along its full length; however, it shall not have a formed reinforcement flange to avoid trapping dirt and debris.

One (1)
45-39-0030

REAR FENDERETTE

Polished stainless-steel fenderettes shall be installed on the rear wheel openings. The fenders shall be wide enough to completely cover the outside rear tire and reduce wheel splash up the sides of the body. They shall be installed with 1/4" hex head bolts, self-tapping sheet metal screws are not acceptable. A full width rubber welt shall be placed between the fenderette and body wheel well opening flange. The outside edge of the welting shall form a "V" bead between the fender and the body side face to prevent moisture from entering. The inside edge shall also have a small, raised bead. The outside edge of fenderette, at the wheel opening, shall be rolled inward to eliminate any sharp edges and avoid injury when cleaning the apparatus.

One (1)
45-39-0060

REAR FENDER PANELS

Painted 3CR12 stainless-steel fender panels shall be provided on the outer face of each fender area. The panels shall be painted to match the job color.

One (1)
45-40-7039

REAR COMPARTMENT

One (1) full height, full width stainless-steel compartment shall be provided at the rear of the apparatus above the tailboard, 42.00" wide x 44.63" high x 28.00" deep. The compartment shall be transverse as standard with a 25.75" wide x 29.75" high transverse area through each rear side compartment. In the rear wall, there shall be a removable access cover adequately sized to service the fuel tank pickup tube and sending unit without having to remove the tank.

The full height compartment shall have a doorframe-to-doorframe dimension of 38.00" wide x 39.75" high. The clear door opening shall be 34.00" wide x 37.00" high. This compartment shall have vertically hinged double doors. The usable compartment space shall be 41.75" wide x 42.25" high x 25.75" deep.

One (1)
45-48-9200

REAR SURFACE OF BODY

The rear facing body surface around the rear compartment shall be covered with smooth aluminum in preparation for the installation of reflective chevron striping.

The inward and side facing walls of each beavertail shall be covered with adequately reinforced bright aluminum tread plate up to the height of the hose bed floor. Then the remaining upper inside surface of the beavertail shall be covered with brushed stainless-steel. All tread plate shall be secured with threaded fasteners.

The rear facing bulkhead of the compartment s, as well as the rear facing edge of the beavertail, shall be painted job color.

One (1)
57-00-0005

HINGED COMPARTMENT DOORS

The side compartment doors shall be "lap" type, double panel construction with 14 gauge outer and 14-gauge 3CR12 stainless-steel inner panels. (NO EXCEPTIONS TO THIS STATEMENT.) Outer pan edges that form the lap portion of the door shall be "hemmed" (bent over and back 180 degrees) over the inner pan edges. Inside corners, at the hem area, shall be welded and ground smooth.

The doors shall be weather stripped with an automotive bulb type extruded rubber inner seal. A second outer seal of closed cell rubber shall be placed on the lap edge of the door to prevent damage to the paint finish. Outer seal shall have corrugated surface to prevent sticking.

The doors shall be mounted on stainless-steel piano hinges with a pin diameter of .25". Mounting holes shall be slotted vertically on one side of the hinge and horizontally on the other side to provide for proper adjustment of the door. The hinge pins shall have spun ends (crowns) at both ends to hold them in place and provide a finished look. Eberhard 206 latches with stainless-steel "D" ring handles shall be provided on the lift, single, drop down, and lock door (double door set-up). The free door (double door set-up) shall have an (2) Eberhard latches top and bottom with a single handle located inside the door (standard location at bottom). Isolation tape shall be furnished between the door hinge and door jam. A rubber gasket shall be provided between the "D" ring handle and the door.

Vertically hinged doors shall be equipped with Hansen 5EZ or Thomas EZ spring type door checks that also hold the doors in the open and closed position. Checks shall be the two-point mounting type for simplicity. Spring tension (15 lb.) shall be easily adjustable. Checks shall have black zinc mounting brackets with stainless-steel springs, 11" long rods and clamps. Springs shall be polished. Horizontally hinged doors shall be held in the opened position with gas cylinder type stays. Switches for automatic compartment light operation shall be installed in the door hinge area.

One (1)
57-00-0015

HINGED REAR COMPARTMENT DOORS

The rear compartment door shall be "lap" type, double panel construction, with .09" 5052-H32 aluminum outer and .09" 5052-H32 aluminum inner panels. (NO EXCEPTIONS TO THIS STATEMENT.) Outer pan edges that form the lap portion of the door shall be "hemmed" (bent over and back 180 degrees) over the inner pan edges. Inside corners, at the hem area, shall be welded and ground smooth. The exterior door shall be DA sanded on any exposed edges.

The doors shall be weather stripped with an automotive bulb type extruded rubber inner seal. A second outer seal of closed cell rubber shall be placed on the lap edge of the door to prevent damage to the paint finish. Outer seal shall have corrugated surface to prevent sticking.

The doors shall be mounted on stainless-steel piano hinges with a pin diameter of .25". Mounting holes shall be slotted vertically on one side of the hinge and horizontally on the other side to provide for proper adjustment of the door. The hinge pins shall have spun ends (crowns) at both ends to hold them in place and provide a finished look. Eberhard 206 latches with stainless-steel "D" ring handles shall be provided on the lift, single, drop down, and lock door (double door set-up). The free door (double door set-up) shall have an (2) Eberhard latches top and bottom with a single handle located inside the door (standard location at bottom). Isolation tape shall be furnished between the door hinge and door jam. A rubber gasket shall be provided between the "D" ring handle and the door.

Vertically hinged doors shall be equipped with Hansen 5EZ or Thomas EZ spring type door checks that also hold the doors in the open and closed position. Checks shall be the two-point mounting type for simplicity. Spring tension (15 lb.) shall be easily adjustable. Checks shall have black zinc mounting brackets with stainless-steel springs, 11" long rods and clamps. Springs shall be polished. Horizontally hinged doors shall be held in the opened position with gas cylinder type stays. Switches for automatic compartment light operation shall be installed in the door hinge area.

One (1)
57-00-200N

Keyed Locks - NONE

One (1)
57-00-200N

Keyed Locks - NONE

Eight (8)
57-00-5200

<u>BRUSHED STAINLESS COMPARTMENT DOOR LINER(S)</u>

Brushed stainless-steel overlay shall be provided on the inside of eight (8) compartment door(s) to protect the painted finish and to cover inside door hardware.

-LS1, LS2, LS3, LS4, and LS5

-RS1, RS2, and RS3

Two (2)
57-00-5200

<u>BRUSHED STAINLESS COMPARTMENT DOOR LINER(S)</u>

Brushed stainless-steel overlay shall be provided on the inside of two (2) compartment door(s) to protect the painted finish and to cover inside door hardware.

One (1)
57-00-6040

<u>BODY DOOR HINGES</u>

All piano hinges on the main body exterior doors shall be polished.

One (1)
57-20-5020

TAILBOARD

The tailboard shall be 19" deep from the rear edge to the body face and shall run the full width of the body (98" wide). The tailboard surface shall be 3/16" thick aluminum tread plate with 2-1/2" deep flanges on the front, rear, and side edges. It shall be installed over a heavy-duty steel framework to prevent the tailboard from bending and flexing. The tailboard support shall be constructed of formed 1/4" - 3/8" plate, 2" X 3" tubes, 2" X 2" angles, and 3" structural channels in a welded assembly. It shall be bolted directly to the chassis frame rails, not the body.

All mounting bolts used to fasten the tread plate to the tailboard support shall be 5/16" truss-head Phillips. Self-tapping sheet metal screws shall not be used to install the aluminum tread plate. There shall be a 1/2" gap between the tailboard and the body to prevent moisture from being trapped. Rear outside corners shall have a 4" 45-degree miter.

One (1)
57-40-0010

REAR BULKHEAD HOOKS

One (1) removable hose holding hook shall be installed on each side at the rear. Shall be installed on the sides of the intermediate step. Shall consist of a aluminum pipe with one end welded shut, with a drain hole, approximately 1 1/2" in diameter welded to an angle, a pipe approximately 20" in length shall be provided that will fit into this pipe, with a detent pin that it chained to the apparatus.

Eight (8)
91-01-0330

FINISH – BODY SIDE COMPARTMENT INTERIOR(S)

Eight (8) body side compartment interior(s) shall be finished with gray Zolatone type paint following the Zolatone Coat application process.

One (1)
91-01-0430

FINISH – BODY REAR COMPARTMENT INTERIOR(S)

One (1) body rear compartment interior(s) shall be finished with gray Zolatone type paint following the Zolatone Coat application process.

Eight (8)
91-01-4310

FINISH – BODY SIDE COMPARTMENT INTERIOR(S)

Eight (8) body side compartment interior(s) shall be clear coated following the Zolatone Clear Coat application process, applying the Clear Coat to the same components that received a Zolatone application.

One (1)
91-01-4320

FINISH – BODY REAR COMPARTMENT INTERIOR(S)

One (1) body rear compartment interior(s) shall be clear coated following the Zolatone Clear Coat application process, applying the Clear Coat to the same components that received a Zolatone application.

One (1)
91-02-2100

DA FINISHED HOSE BED

The interior of the hose bed shall be "DA" finished only; no paint shall be provided. If the body is made of stainless-steel, the exposed surfaces on the interior of the hose bed shall be manufactured with 304 stainless-steel.

One (1)
91-75-0530

WARRANTY

The water tank manufacturer shall provide a limited lifetime warranty.

One (1)

== Body Options - Matrix Pumper - 0.000 ==

One (1)
45-60-0100

HOSE LOAD

LH / 1.75" 350' (Two (2) stacks) / 3.00" 750' (Four (4) stacks) / 3.00" 750' (Four (4) stacks) / 2.50" 250' (Two (2) stacks) / 1.75" 250' (Two (2) stacks) / RH

One (1)
45-60-0200

HOSE BED

The hose bed shall be a minimum of 70" wide and shall be thoroughly reinforced at the corners. Removable aluminum grating shall be installed in the bottom of the hose bed to provide ventilation. The grating slats shall be 4-5/8" wide by 1/2" thick and shall have a corrugated or ribbed surface to help drain and dry the hose. The interior of the hose bed body shall be smooth and free from all sharp projections that might damage the hose.

Pumper Body Style:
The shape of the hose bed for a pumper body shall be rectangular, 70" wide as standard.

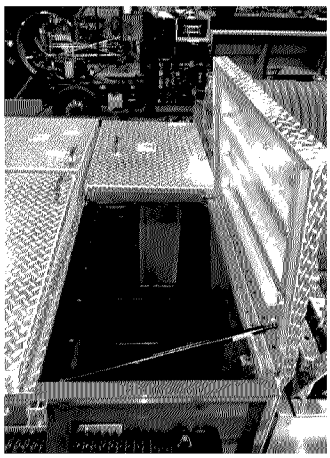
Rescue Pumper Body Style:
The shape of the hose bed for a rescue pumper body shall be T-shaped when the tank is shorter than the height of the body sides. The upper portion shall be 70" wide between the risers as standard. The bottom portion of the hose bed between the compartments shall be 42" wide.

Choosing options such as hatch compartments, hydraulic ladder rack, and/or split body styles (one side pumper and one side rescue) may change the width and shape of the hose bed.

One (1)
45-65-1005

HOSE BED CROSS PANEL DIVIDER

A hose bed cross panel divider shall be provided to separate the tank fill tower(s) from the hose load. The divider shall be constructed of 304 stainless-steel and shall have a DA finish. The divider shall be installed laterally 24.00" from the front body face. The divider shall be bolted in place, allowing for its removal to facilitate tank removal.



The area created forward of the Cross Panel divider, the ATP cover shall be of two-piece design, with a center divider to support, door shall be of a design to limit water intrusion with a chrome handle on each door, the doors shall be tied to the hazard warning system, and have gas struts These doors shall be flat.

Four (4)
45-65-1610

HOSE BED DIVIDER(S)

Four (4) 304 stainless-steel hose bed dividers, with DA finish, shall be provided to separate the individual hose loads. The divider shall be constructed with a flanged foot that runs the full length of the partition. The divider(s) shall be fully adjustable by providing slide tracks at the front and rear of the hose bed. The divider shall be held in place by two (2) 5/16" tapered bolts at each end of the partition.

The mounting bolts shall turn into threaded slide blocks located in the track. Holes in the foot shall be countersunk so the bolt head is flush with the surrounding surface and shall not damage the hose. The front of the dividers shall be tied to the front hose bed bulkhead. There shall be a handhold on the back edge of the rear of the partition. The handhold shall be the full height of the partition from the top and bottom edges.

Four (4)
45-65-1710

The hose bed dividers height shall approximately match the height of the body risers.

One (1)
45-68-1210

HOSE BED COVER

A 1/8" thick aluminum tread plate hose bed cover shall be provided. They shall fully cover the entire top of the hose bed. The cover shall be made of two (2) doors with continuous piano type hinges bolted to each hose bed side panel. Hinges shall be bolted to the covers. Edges of each cover shall be flanged down 1-3/8" and each corner shall be welded. Each cover shall be reinforced with 1-1/4" square tubes welded to the underside of the cover for increased strength.

The covers shall be supported by a 2" x 3" tubular A-frame assembly. This A-frame support shall be bolted between the left-hand and right-hand risers (or body sides if no risers are needed) at the rear of the hose bed. There shall be a center drainage trough permanently incorporated into the A-frame supports. The covers shall lap onto this trough when closed. The A-frame support shall be higher in the center to create a downward slope to each side of body for proper moisture drainage. A gas cylinder rated at 150 lbs. shall be installed on each cover to assist in lifting it. Cylinders shall also hold the covers in the raised position. An aluminum tread plate panel shall be provided to close off the front of the hose bed.

There shall be four (4) chrome finished cast handles mounted on the top of the covers as follows: two on each cover, one at the front and one at the rear mounted perpendicular to the hinge and located along the forward and rearward edges and against the edges where the covers meet.

One (1)
45-68-121B

The hose bed cover shall extend to the mid-cross panel divider.

One (1)
45-68-121F

The A-frame and/or the center support shall be painted job color.

One (1)
45-68-1250

WEIGHTED END FLAPS

A weighted and secured vinyl cover shall be provided for the rear of the aluminum hose bed cover. The cover shall be made of 20 oz. per square yard polyester coated with a urethane topcoat (vinyl). The vinyl shall be permanently attached to the ATP cover and have stainless-steel spring clips and stainless-steel hooks on the bottom corners. This cover combination shall secure the hose from unintentional deployment while the vehicle is underway in normal operations. There shall be no Velcro in between the flaps.

Shall not have Velcro between the flaps.

One (1)
45-68-125R

The hose bed cover vinyl end flaps shall be red in color. Color number of vinyl is 705-1064.

One (1)
45-68-1260

FAMA26 NO-STEP SIGN

In accordance with NFPA 1901 chapter 15.7.1.6, a FAMA26 "No-Step" sign shall be located on the front and rear of the aluminum tread plate hose bed cover. The sign reads: "Fall Hazard-Railings NOT provided. Surface may be slippery - Not intended for stepping, standing, or walking. Fall will injure or kill"

One (1)
45-68-1275

BACKBOARD STORAGE

An open slide-in type backboard storage compartment shall be provided on the right underside of the hinged aluminum tread plate hose bed cover.

Slot shall provide 3.50" clearance and 17" wide for the backboard to slide in.

One (1)
57-00-1800

REVERSE HINGE FRONT COMPARTMENT DOORS

The front side compartment door, at each side of the body, shall be hinged at the rear of the door so that it opens away from the pump panel. This modification is required to allow for easier access to the compartments from the operator's position.

Eleven (11)
57-00-3500

COMPARTMENT DOOR SILL PROTECTOR(S)

A brushed stainless-steel sill protector, approximately .50" wide, shall be provided on eleven (11) body compartment door sill(s) to protect the painted finish.

The following compartments shall have a brushed sill protector:

LH side operator's stand, LS1, LS2, LS3, LS4, and LS5

RH side operator's stand, RS1, RS2, and RS3

REAR

Fourteen (14)
57-05-0100

DRI-DEK®

Fourteen (14) black Dri-Dek® mat(s) shall be provided and installed on body compartment floors and/or in shelves/trays as specified. Ramped edging shall not be included.

Three (3)
57-05-3030

ADJUSTABLE SHELF OR SHELVES

Three (3) adjustable shelf or shelves (with open corners) made from 12 gauge 304 stainless-steel shall be provided in the body compartment(s). Each shelf shall be supported by four (4) stainless-steel angles bolted to Aluma-Strut tracks for adjustability.

When in a split depth compartment, the Aluma-Strut tracks shall only be provided in the upper or lower area where the shelve(s) are located.

The one (1) shelf in the REAR compartment, the strut will extend down from the top of the compartment 23", with the shelf 18.75" from the floor.

Fourteen (14)
57-05-5195

The location of the compartment option(s) shall be as follows:

Floors - LH side operator's stand, LS2, LS3, LS4, and LS5

Floors - RH side operator's stand, RS1, RS2, and RS3

Floor - REAR

Shelves - One (1) REAR, RS1, and LH operator's stand compartment

Hose bed dunnage area.

Redondo Beach Fire Department

Long Beach Spec

Three (3)
57-05-5195

The location of the compartment option(s) shall be as follows:

One (1) - REAR,

One (1) - RS1, Right side front lower.

One (1) - LH Operator's Stand Compartment.

One (1)
57-10-0095

COMPARTMENT CHEST

American Eagle heavy duty steel drawer system consists of:

Telescoping top tray, 2.5" built-in risers, heavy duty 500 lb. ball bearing slides, key lockable chrome plated t-handle(s) with concealed latching hardware, removable drawers, gray powder coated front panels and galvanized components.

Each drawer includes front-to-back dividers. Lifetime warranty (original owner) on slides, handles, and latches.

1 - 27.50" H X 18" W X 24.75" D

4 - 3" 1-4" 1-7" - DRAWERS

2.5" RISER, STD TOP TRAY

One (1)
57-10-0200

MIKE COMPARTMENT

A mike and speaker compartment with brushed finish stainless-steel door with chrome plated latch shall be furnished adjacent to the pump operator's panel on the front face of the driver's side body. The compartment size shall be 9" wide x 12" high x 8" deep with a 7" x 11.75" door opening. Shall be above the 2nd folding step, the step does not interfere with the door.

One (1)
57-10-0605

WEATHERPROOF SPEAKER AND GRILLE

There shall be a University MM-2F weatherproof speaker mounted on the front of the body near the pump panel. The speaker shall be located above the mic box and have a hi-polished S/S cover.

One (1)
57-12-0100

FENDER STORAGE

Storage compartments in the fender area of the apparatus shall be comprised of the following:

One (1)
57-12-0110

On the driver's side of the apparatus, forward of the rear axle there shall be:

One (1)
57-12-0140

On the driver's side of the apparatus, aft of the rear axle there shall be:

One (1)
57-12-0150

On the officer's side of the apparatus, forward of the rear axle there shall be:

One (1)
57-12-0180

On the officer's side of the apparatus, aft of the rear axle there shall be:

One (1)
57-12-0720

One (1) enclosure to accommodate two (2) air bottles, fabricated of high impact polyethylene material, with a minimum of 26.0" usable depth, and an 8.0" inside diameter. The double oval compartments shall have a single wide opening and a raised nylon center divider to prevent the bottles from rolling together. A detainment strap shall be installed.

One (1)
57-12-0720

One (1) enclosure to accommodate two (2) air bottles, fabricated of high impact polyethylene material, with a minimum of 26.0" usable depth, and an 8.0" inside diameter. The double oval compartments shall have a single wide opening and a raised nylon center divider to prevent the bottles from rolling together. A detainment strap shall be installed.

One (1)
57-12-0730

One (1) enclosure to accommodate one (1) fire extinguisher (not included), fabricated of high impact polyethylene material, with approximately 26.0" usable depth, and an 8.0" inside diameter. A detainment strap shall be installed.

One (1)
57-12-0730

One (1) enclosure to accommodate one (1) fire extinguisher (not included), fabricated of high impact polyethylene material, with approximately 26.0" usable depth, and an 8.0" inside diameter. A detainment strap shall be installed.

Redondo Beach Fire Department

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Four (4)
57-12-0810

Four (4) fender storage doors shall be constructed of 12 gauge brushed stainless-steel secured by a full-length stainless-steel hinge and a push button lever latch.

One (1)
57-20-7900

BODY REAR STEPS

There shall be large polished, chrome plated, cast aluminum folding steps, each with integral LED light, on both sides of the rear, in sufficient quantities, to meet NFPA regulations for the height configured by the body and tank chosen.

Steps are to be offset, the lower step is to be forward and upper step rearward on the beavertail, two steps each side with the intermediate step. Steps to have integral LED lights.

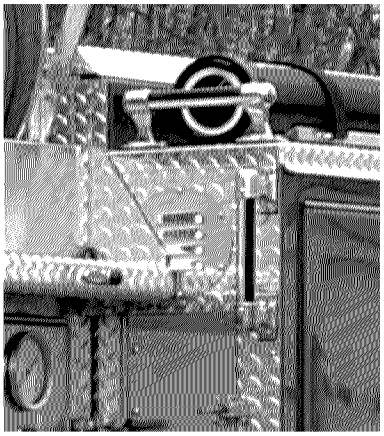
One (1)
57-20-7930

BODY FRONT STEPS

There shall be two (2) chrome folding steps on the driver's side front of the body. The folding steps shall be a minimum of 42 square inches of serrated non-skid surface per step. Each step shall be tested to withstand a minimum of 2000 pounds of static load. Heavy duty stainless-steel springs shall be incorporated in the hinge to hold the step in either the open or closed positions.

Two (2) 8" aluminum rubber insert grab rail shall be provided on the front driver's side of the body, as high as possible in compliance with NFPA 1901 requirements for 3-point contact for access and egress at that location.

Shall be 8"aluminum rubber insert handrail, one (1) shall be on the forward face of the body side, mounted vertically at the upper corner outboard edge. Second handrail to be on top of body side to side, reference photo for placement. Steps to have integral LED lights.



One (1)
57-20-7970

BODY FRONT STEP

There shall be one (1) chrome folding step on the officer's side front of the body.

The folding step shall be a minimum of 42 square inches of serrated non-skid surface per step. Each step shall be tested to withstand a minimum of 2000 pounds of static load. Heavy duty stainless-steel springs shall be incorporated in the hinge to hold the step in either the open or closed positions.

One (1) 8" aluminum rubber insert grab rail shall be provided on the front officer's side of the body, as high as possible in compliance with NFPA 1901 requirements for 3-point contact for access and egress at that location.

The 8" handrail to be rubber insert and located at the final inspection. Steps to have integral LED lights.

One (1)
57-20-8040

REAR STEP

An 8" deep intermediate rear step shall be provided above the rear compartment. The step shall be constructed of .13" aluminum tread plate flanged down and in for added strength.

Step shall be the width of the rear compartment, with gussets down, there shall be a welded handrail knurled with cutouts provided in the step.

Step must match 78J84-89 design.

One (1)
57-20-804A

YELLOW PERIMETER MARKING

In accordance with NFPA 1901 chapter 15.7.1.6, all four top sides of the perimeter of the intermediate step shall be marked with a one-inch-wide safety yellow line to delineate the designated standing or walking surface area.

One (1)
57-25-0110

BODY HANDRAILS

Handrails to be 1-1/4" diameter extruded, aluminum with rubber inserts with a bright anodized finish.

All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless-steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface on which they are mounted. A drain hole shall be provided in each bottom stanchion.

Handrails shall be installed as follows:

Rear handrails are approximately 40" and to be located same as 78J84-89. Each handrail shall be located so as to provide a 3-point stance while climbing onto and off the rear step.

One (1) intermediate handrail shall be installed below the hose bed, is integral with the intermediate step and is knurled aluminum.

Additional handrails may be required per NFPA, dependent upon body configuration.

Two (2)
57-25-8000

ADDITIONAL HANDRAIL(S)

Two (2) 8" knurled aluminum handrail(s) shall be provided and mounted on the body. Handrail(s) shall be supported by chrome plated stanchions and be of similar construction and utilize the same mounting hardware as the other handrails on the apparatus, i.e. with rubber inserts, rubberized gaskets, stainless-steel bolts, etc.

One (1)
57-25-8100

ADDITIONAL HANDRAIL(S)

One (1) 8" rubber insert aluminum handrail(s) shall be provided and mounted on the body. Handrail(s) shall be supported by chrome plated stanchions and be of similar construction and utilize the same mounting hardware as the other handrails on the apparatus, i.e., serrated exterior surface with rubber inserts, rubberized gaskets, stainless-steel bolts, etc.

One (1)
57-25-8195

The location of the handrail(s) shall be as follows: located at in-process, final inspection, or shipped loose.

Two (2)
57-25-8195

The location of the handrail(s) shall be as follows: located at rear of body on top of risers, one each side.

Four (4)
57-30-0120

RUB RAIL - BODY SIDES

Brushed stainless-steel rub rails shall be provided along the lower portion of the body, beneath the compartment doors, on each side to prevent damage to the body and finish. The rub rails shall be a minimum of 2-3/8" wide x 1" deep and shall be mounted on rubber supports. Rub rails shall have a 1" x 1" chamfer at the front and rear of the rails. The rails shall protrude a minimum of 1.75" from the face of the body.

Three (3)
91-01-5300

FINISH - ADJUSTABLE SHELF (OR SHELVES)

Three (3) adjustable shelf (or shelves) shall have a DA finish on the outside edge of the shelf.

One (1)

== Misc. Equipment - SFA Chassis Pumper - 0.000 ==

One (1)
00-05-330S

GENERATOR/INVERTER TEST AND CERTIFICATION

The generator/inverter shall be third party tested at the manufacturer's facility and shall conform to NFPA requirements and standards. Copies of all tests shall be provided with the delivery documentation.

One (1)
70-02-0010

The hydraulic generator shall be located in the open bin over the pump house.

One (1)
70-05-0718

POWER INVERTER

One (1) Xantrex PRO model XM1800 power inverter with remote operation/control panel shall be installed. The inverter shall convert DC power stored in batteries into AC power to operate electronics and appliances. The digital remote control shall display power output, AC source and battery voltage.

Inverter will be installed from the ceiling in the left upper body compartments. the inverter shall be installed as centered as possible between the two compartments. Shall be spaced off the ceiling and cover for proper ventilation. There shall be a vented cover, painted to match the body interior, provided that will protect the inverter, on the outboard face of the cover the control panel shall be installed.

Display shall be in Zone 5 of the dash.

Two (2)
70-05-1920

120 VOLT INVERTER POWERED RECEPTACLE(S) IN CAB INTERIOR

Two (2) 120-volt, 20 amp, 3-wire receptacle(s) shall be provided in the cab interior in accordance with NFPA guidelines. A brushed stainless-steel cover plate shall be provided to protect the receptacle. The receptacle shall be powered by the Inverter and labeled accordingly.

Shall be located one (1) each side of under the forward-facing crew seats, out-board, down low to the rear of the cab.

Two (2)
70-05-2535

NEMA Rating: 5-20R (20 Amp) Non-Twist-Lock, Duplex.

Two (2)
70-05-2720

Two (2) stainless-steel wall plate(s) shall be installed.

Redondo Beach Fire Department

Long Beach Spec

One (1)
71-0W-AP2W

CAB 12V FRONT BROW MOUNT LIGHT(S)

One (1) Whelen Pioneer Plus™ PFH2 dual panel LED floodlight(s) shall be installed on the cab front brow, using a Whelen PBHSEAGR mounting bracket. The light head shall provide 17,750 lumens and draw 13 amps. It shall operate at 12-volts DC.

The light head and mounting bracket shall be powder coated white.

One (1)
71-1Z-0009

The mount shall be on the center of the cab front brow.

Two (2)
71-AW-AP2W

CAB BACK 12V TELESCOPIC LIGHT(S)

Two (2) Whelen Pioneer Plus ™ PFH2P dual panel flood light(s) on a Whelen model 3000 side mount telescopic pole (Pole Assembly number 86930QB4) shall be installed on the back of the cab.

The 57" extruded aluminum telescopic pole assembly includes a 20" outer body bottom collar placement, a 4/C Internal (DC), bottom wire exit, 3" silver side mount brackets, pole cradle, cradle mount light position sensor and pole/pedestal mount adapter with handle.

The light shall operate at 12-volts DC, draw 13 amps, and generate 17,750 lumens of light.

The light head shall be powder coated white.

Shall be set that they are above the cab roof side facing, Whelen Telescopic poles do not have a rotational lock (the pins shall be removed from the bottom of the poles), the only lock is in the collar, which is tightened by hand.

Two (2)
71-BZ-0010

The cab telescopic pole lights shall be located one each side of the cab back.

Two (2)
71-BZ-0110

The cab telescopic pole light head height(s) shall be above the cab roof and shall face the side.

One (1)
71-Y0-0010

One (1) 12-volt light(s) shall be switched at the cab dash.

Two (2)
71-Y0-0010

Two (2) 12-volt light(s) shall be switched at the cab dash.

Lightbar alley lights shall be switched with the cab mounted scene lights.

Redondo Beach Fire Department

Long Beach Spec

One (1)
90-00-0100

GROUND LADDERS

Ladders shall be provided in full compliance with NFPA 1901 requirements for pumper trucks. Forty-eight (48) feet of Duo-Safety ladders shall be provided as follows:

-One 24 ft., 2-Section -Model 900-A

The 24-2 section is mounted outboard of the roof ladder.

-One 14 ft., Roof -Model 775-A

The 14' Roof ladder is mounted inboard of the extension ladder.

-One 10 ft., Folding -Model 585-A

The folding ladder shall be mounted below the ground ladders, on S/S DA finish brackets, from the unistrut that holds the ladders. Stored in the Zico Spring Clips, pike pole tubes are inboard of the folding ladder.

One (1)
90-00-9500

FOLDING LADDER BRACKETS ONLY

Spring loaded mounting brackets shall be provided for Duo-Safety folding ladder.

One (1)
90-00-9510

LADDER BRACKETS AND CLAMPS

The ladders shall be installed on the right side of the hose body on stainless-steel Unistrut with a mill finish. The ladder brackets shall have up and down adjustment without the need to drill holes or modify the brackets. The Unistrut's shall be bolted to the upper flange of the hose bed at the top and to the compartment top at the bottom. Circular rubber spacers shall be used behind the ladder brackets to maintain the offset from the hose body side.

Polished aluminum pull/quarter turn type ladder clamps shall be provided for the ground ladders. They shall be vertically adjustable up and down independent of the ladder brackets. Clamps shall be attached to a stainless-steel spring-loaded shaft. Clamp spring tension shall be adjustable. The spring assembly shall be fully enclosed within a white metal cast housing. Housing shall be painted a silver/gray color. A vertically adjustable rubber bumper shall be placed in the ladder bracket mounting guide to serve as a stop or rest for the inside lower ladder beam and to prevent it from hitting and damaging the body sides.

One (1)
90-00-9700

LEATHER LINED BRACKETS

The ladders brackets shall be leather lined to prevent damage to the ladders.

Redondo Beach Fire Department

Long Beach Spec

One (1)
90-03-01AS

HOSE TROUGHS

Two (2) smooth aluminum, mill finish hard suction hose troughs for 4.00" hose shall be provided and installed. Each trough shall include two (2) aluminum mounts and (2) Velcro straps to secure the sleeve in place. Hose troughs shall be mounted to Unistrut stakes on the body.

One (1)
90-03-01ZT

The hose trough shall be located one on each side of the body.

Two (2)
90-03-5025

SUCTION HOSE(S)

Two (2) Kochek PVC flexible #2P407 suction hose(s) shall be provided. The suction hose shall be 10 feet in length, 4" ID and have 4" Storz swivel couplings.

One (1)
90-05-0100

PIKE POLES/MOUNTING

The following pike poles shall be furnished:

Provide NUPLA rubbish hook w/ "D" handle #36-651-RH-6DA. Provide NUPLA pike pole w/ "D" handle #36-126-YPDH-4DA. Both shall be mounted on top of RH fender compartment with a shoe and clips.

One (1) 10ft NUPLA model #YPD-10 pike pole w/ fiberglass handle provided and mounted inboard of the folding ladder.

The interior of the sleeve that secures the handles shall be lined with poly to limit movement and damage to the handles. The trash hook that is mounted to the front, shall have a small bracket, from ATP, which is open to the side, which prevents the pike pole from sliding forward in braking situations. This bracket will just cover a portion of the tines, not the entire head.

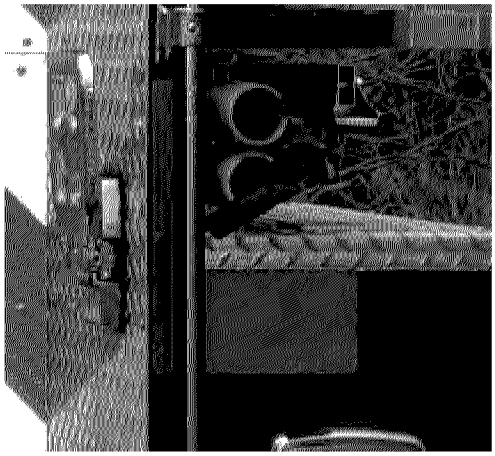
Ref 78J84-89 final pictures for exact layout.

One (1)
90-05-5000

ROOF HOOK(s)

One (1) 6 ft. Fire Hooks "NY" fire hook(s) model RH-6 with handle(s) shall be provided.

A brushed stainless-steel scuff plate the rear body face (ref 78J84-89)



Two (2)
90-05-6250

PVC PIKE POLE MOUNT(S)

Two (2) PVC tube(s) shall be mounted to facilitate storage of pike poles.

The mounting tube(s) shall be located inboard of folding ladder.
Ref final pictures of 78J84-89 for exact location.

One (1)
90-21-0600

WHEEL CHOCKS

Two (2) Worden HWG wheel chocks shall be furnished and shipped loose by the apparatus manufacturer.
Two (2) U815 holders shall be installed by the manufacturer, brackets shall be located at final inspection.

One (1)

== Paint & Striping - SFA Chassis Pumper - 0.000 ==

One (1)
91-00-1000

PROCESSES

The following processes shall be employed in the finishing of the apparatus:

Manual Surface preparation – All metal surfaces on all custom body and cabs shall be thoroughly cleaned and prepared for paint. Surfaces that shall not be painted include all chrome plated, polished stainless-steel and bright aluminum tread plate. As required, weld seams and other areas shall be caulked to prevent water leaks or for appearance reasons. Each imperfection on the exterior metal surface shall be removed or filled and then sanded for a smooth flat appearance.

Chemical Cleaning and Treatment – All painted surfaces shall be washed with a chemical degreaser, cleaner and surface conditioner to allow for proper adherence of primer coat. Then they shall be washed with a neutralizer product. All products used are approved by paint supplier and applied under strict process control to meet performance requirements on corrosion prevention and chip resistance.

Primer/ Surface Coating for Topcoat application – a minimum of 2 coats of Epoxy based primer shall be applied to surfaces inside and outside of cabs and bodies and all other parts of apparatus that shall receive a Top color coat to achieve required corrosion protection. After that, a minimum of 2 coats of sealer shall be applied over the primer surface. The overall thickness of the primer/sealer coat shall be between 3 to 8 mils wet. Once dried and cured all surfaces that shall receive a topcoat shall be hand sanded to achieve a flat and smooth surface to meet gloss and other paint quality standards. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements according with Seagrave's Paint Quality Standard. The underside of the cab and body shall be finished with one coat of epoxy primer specifically designed for this application to prevent corrosion and provide chip resistance to typical paved road conditions.

Topcoat Application – Each Topcoat final color on the apparatus is applied using a two-stage paint process. The unit shall be thoroughly hand cleaned to eliminate dust residues and to detect any imperfection in the surfaces to be painted. A fast drying 3.5 VOC polyurethane basecoat color shall be applied using a cross coat application technique. Additional coats may be applied as required until the coat thickness reaches 2.0 to 6.0 mils wet and a full hide appearance. If a second color is required, proper masking shall be applied to the unit and the basecoat application process shall be repeated for the second color. A slow drying low VOC High Build clear coat shall be applied using a cross coat application technique until a minimum of 5.0 mils wet is achieved. The unit is then properly heated to assure flash and cure of the paint before leaving the paint booth. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements according to Seagrave's Paint Quality Standard.

Each batch of color topcoat shall be tested for precise color match following paint supplier color matching process. A visual color match shall be checked prior to paint using customer approved paint chips.

The cab and body shall be primed, and finish painted prior to installation on the chassis to ensure paint coverage in all areas including the difficult to reach places. The exterior and interior of the cab shall be finish painted before the doors are installed or any assembly is started to ensure a finish painted surface beneath all trim items.

Primer/ Surface Coating for Single Coat application – a minimum of 2 coats of Epoxy based primer shall be applied to all surfaces of the apparatus that shall receive a single-color coat to achieve required corrosion protection. This is a wet coat process, and it shall achieve a 3.0 to 8.0 mills wet thickness and complete coverage of all bare metal. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements according with Seagrave's Paint Quality Standard.

Single Coat Application – A minimum of 2 coats of direct gloss paint shall be applied over all primed surface to achieve corrosion protection and appearance in accordance with Seagrave's Paint Quality Standard. This application shall be used for Gloss Black, Job Color and Color finishes in parts of the

apparatus such as frame rails, outriggers, ladders and other aerial devices, suspension, and other chassis parts, etc. as defined in the sales order.

Zolatone Coat Application – All areas to receive a Zolatone coat shall be primed following the primer/surface coating for topcoat application. A high-pressure coat of Zolatone paint shall be applied in a cross-pattern technique to achieve smooth finished surface. A second low pressure coat of Zolatone paint shall be applied in a single pattern to achieve a textured appearance.

Zolatone Clear Coat Application – Starting with a completed and dry Zolatone coat application 2 to 3 coats of Zolatone clear coat shall be applied until a thickness of 5.0 mills wet is achieved.

PAINTERS

All painters shall be painting supplier certified. They shall be re-certified periodically in order to keep up to current standards and procedures required by the coatings manufacturer. This certification is performed independently by the paint supplier.

FACILITY

The finishing facility shall be certified independently by the paint supplier by meeting or exceeding its extensive and stringent requirements. The paint facility shall be audited quarterly by the paint supplier to ensure proper equipment, procedures and safety regulations are being used and adhered to in addition to the controls implemented by Seagrave to assure paint quality requirements are met in every job.

QUALITY STANDARDS

The finish quality and appearance shall be in accordance with the Seagrave's Paint Quality Standards for dirt, gloss, reflectivity, clarity and depth of image. The standard is available to the customer at any time upon request.

One (1)
91-00-4500

FRAME & UNDERCARRIAGE FINISH

The suspension, axles, air tanks, fuel tank, etc., shall be matte black finish as supplied by the component manufacturer. The chassis frame rails, cross members, cab pivot points and front bumper extension shall have an additional coat in the color selected in this order applied over the primed surface as supplied by the component manufacturer. Single Coat application process shall be used to apply the color selected in this order using direct gloss paint on identified parts.

The following items shall be furnished with the finish as provided by their respective manufacturer.

Engine, transmission, and accessories.
Exhaust system.
Retarder (when furnished).
PTO & hydraulic pump (when furnished).
Cab lift cylinders & hydraulic pump.
Shock absorbers.

Fuel filter.
Air drier and air cleaner.
Electrical wiring and loom.
Air brake lines, valves and mounting brackets.

Cab exterior paint number shall be #76936 Mack red.

One (1)
91-00-5000

PAINT INSIDE OF CAB

The inside of the cab shall be provided with gray Zolatone paint following the Zolatone Coat application process.

The following components shall be painted:
Exposed interior surfaces of the cab structure
Exposed interior surfaces of the driver/officer/crew doors
All interior "Metal" access/wire covers of the cab
Head bumper brackets
Miscellaneous brackets if present: camera mounts, non-recessed radios, charger covers.

One (1)
91-00-5400

PAINT INSIDE OF CAB

The inside of the full tilt cab shall be clear coated following the Zolatone Clear Coat application process in the same components that received a Zolatone application.

One (1)
91-00-5900

SINGLE COLOR CAB PAINT

The cab shall be painted one color. The paint shall follow the Topcoat application process for a single color.

Cab exterior paint number shall be #50 Pierce red.

One (1)
91-00-A110

A decorative molding shall be provided around the cab. The decorative molding shall be horizontal across the front of the cab above the wipers and taper down with a radius even with the outside corners of the grille.

One (1)
91-02-1000

BODY PAINT, SINGLE COLOR

The body of the apparatus shall be painted to match the primary cab color. The paint shall follow the Topcoat application process for a single color.

Cab exterior paint number shall be #50 Pierce red.

Redondo Beach Fire Department

Long Beach Spec

One (1)
91-02-2AZ0

OPERATOR STAND FINISH

The operator stand compartment interior, pump, intake and discharge valves, drains, drain lines, and foam system components, and all hard piping, shall have mill finish.

Mill Finish All Pipe

One (1)
91-02-4500

STANDARD FINISHES FOR SMALL PARTS, 2010 CUSTOM CAB

Definition: Mill Finish: as is from the manufacturer; no finish applied. It may have scratches, but it shall be shiny as a result of being cleaned through a deoxidization process. Parts with mill finish may have been cleaned in a dipping process to deoxidize the part.

Definition: Etchfinish: The part(s) shall be cleaned and etched to a uniform bright finish.

CHASSIS

Chassis bracket: Painted same as cab exterior

CAB

Cab compartments, including cab side access compartments:
Exterior Finish: Line-X.
Interior Finish: Mill finish (Upgrade available to DA or Paint)

Cab compartment shelves:
DA (Just the outside edge of the shelf shall be DA'd. All other surfaces shall be mill finish.)

CAB – BODY

Bumper / running board hose wells:
Flange: DA
Interior & exterior walls: Mill finish
If the hose well sticks above the gravel pan: DA the edges

Inner liners: Mill finish

All steps, including pull downs & those on access ladders: DA outsides

Hat Section Bracket for Compartment, Ground or Step Lights: Mill finish. If compartment is painted, then the hat section brackets shall be painted.

Redondo Beach Fire Department

Long Beach Spec

Trim Rings: Mill finish

Patch plates: Brushed S/S (Upgrade available to polished or ATP) STD is No patch plates

Label backing plates: DA

Marker light guards: As purchased

Switch guards – S/S: Brushed

OPERATOR STAND AND PLUMBING

Plumbing: Pump, intake & discharge valves, drains, all hard piping*, including pipes protruding from the pump panel: Mill finish (Upgrade available to job color)

*1. All exposed pipe (not including cut threads) at the rear of the truck or welded pre-connect assemblies at the front of the body shall be Mill Finish

*2. All pipe holding brackets made of black steel shall be painted black, or job color if the whole surrounding area is painted job color.

Pump enclosure interior: Mill finish (Upgrade available to job color)

Open bin interior surfaces: Mill finish (or ATP if that is the original surface). In no cases, paint unless "specialed" by the customer.

Crosslays –
Inside surfaces – DA
Partitions - DA

Speedlays:
With pull out tray- DA

Heat Pans: Mill finish (Upgrade available to DA or paint color of underside)

Running Board w/ Floating Trough: Frame shall be painted black.

BODY

Compartment louvers: Same color as compartment interior walls,

Compartment shelves & trays:
DA (Just the outside edge of the shelf shall be DA'd. All other surfaces shall be mill finish.
Upgrades available: Paint Zolatone or job color. All surfaces shall be painted.

Compartment shelf & tray brackets: Mill finish

Redondo Beach Fire Department

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Brackets to hold compartment doors open: Mill finish

Compartment door auxiliary locking brackets: Brushed

Rear aluminum compartments: Mill finish (upgrade available to paint)

Rear aluminum compartment door interiors: ATP Exterior Door: DA Finish Interior
Smooth Exterior Door: Etchfinish Interior

Breaker box mounting brackets: Mill finish

Pegboard: Mill finish (upgrade available to DA)

Hose chutes & Ladders-Thru Compartments: Mill finish (upgrade available to paint)

Partition mounting brackets: Mill finish
Hydraulic ladder rack: Etchfinish (Upgrade to paint job color)

Ground ladder brackets: Etchfinish

Ground ladder or suction racking (fixtures, slides) within compartments: Mill finish

Pike poles tubes - Aluminum: D/A (Upgrade available to paint)

Pike poles tubes – S/S: D/A (Upgrade available to paint)

Wheel chock holders: Mill finish

AERIAL COMPONENTS

Turntable floor grating: DA sides

Turntable underside (except cut away area): Painted

Pedestal cover brackets: DA

Pedestal cover interior: DA

Pedestal compartment door interiors: Mill finish

Electrical compartment panels:
Upper connection panel – Mill finish
Lower ECM panel – Mill finish

Aerialscope forward body step: DA

Grating on top of body: DA sides

Redondo Beach Fire Department

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Jack control boxes:
- Interior – Mill finish
- Door interiors – Mill finish

Cab avoidance switch brackets: Mill finish

Outrigger pad holder brackets: Mill finish

Outrigger pads: Mill finish

Downrigger watt pin & watt pin holder: DA

Piping – Swivel to Waterway: Mill finish

Waterway: Mill finish

Waterway brackets: Mill finish

Monitor: Mill finish

Brass elbow on cord reel on aerial: Mill finish

Cat Track holders/ boxes: Mill finish

Aerialscope Boom:
- Base section and steel base collars – Painted boom color
- Aluminum extendable sections and collars - DA

Aerialscope & Apollo Basket:
- Control box – DA
- Under basket L brackets – Mill finish
- Under basket L bracket covers – Mill finish
- Under basket L bracket piping – Mill finish
- Under basket heat pans – Mill finish
- Under basket waterway piping- Mill finish
- Basket assembly parts- Etchfinish

Mounts/ brackets to hold ladders to aerial or boom: Painted same color as ladder

Mounts/brackets to hold pike poles to aerial or boom: painted same color as ladder

Mounts/brackets to hold stokes basket to ladder: painted same color as ladder
(ATP box to hold basket shall be mill finish)

One (1)
91-02-4550

ACORN NUTS

Acorn nuts shall be installed on all exposed screws and bolts in areas where personal injury may result and/or damage to equipment may occur. For further details, please refer to the enclosed standards document.

One (1)
91-03-2990

REFLECTIVE STRIPING

Reflective striping shall be provided by the Sales Representative in accordance with the current version of NFPA 1901.

One (1)
91-03-410D

CHEVRON STRIPING

The rear facing body panel under the hose bed shall be covered with 6" wide 3M™ Diamond Grade™ Reflective striping in an alternating chevron pattern with the stripes running at a 45-degree downward angle from the top center of the vehicle.

One (1)
91-03-4830

The chevron striping shall be alternating Scotchlite™ Red 983-72NL and Scotchlite™ Fluorescent Yellow-Green 983-23.

One (1)
91-04-000D

Lettering Shall be Provided by Dealer

One (1)
91-04-9900

APPARATUS LOGOS AND NAME PLAQUES

Logos and name plaques shall be placed on the apparatus as identified on the attached PDF.

The "CAPITOL" flame plaque shall be on the cab side access door, with the polished S/S Seagrave Script Below. Polished S/S Seagrave Script shall be in the body fender well each side, Seagrave Script on rear of body to be Polished S/S.
Rear Script to be Centered above the body compartment.

One (1)
91-04-9905

PLACARDS

Shall be same style as front bumper, as customer uses magnetic panel, screws shall be countersunk. One each side of cab, between warning lights and bug eye, and one rear of body left-hand side up high. The placard shall be painted job color of the lower half of the cab. The placard shall measure approximately 12" wide x 10" high.

One (1)
91-04-9930

PLACARD

Shall be bolted on, not slide in, reference Long Beach, 78J84-89, located in the center of the bumper, Plate must be made from a material that is magnetic, and painted job color red. The placard shall measure approximately 12" wide x 10" high.

One (1)
91-04-999C

The placard shall be located as specified:

Ref 78J84-89, located in the center of the bumper.

One (1)

== Warranty & Docs - SFA Chassis Pumper - 0.000 ==

One (1)
91-50-012A

MANUFACTURER'S LIMITED WARRANTY

A Seagrave limited two (2) year warranty for parts and labor shall be provided.

One (1)
91-50-0205

CAB FIFTEEN YEAR STRUCTURAL LIMITED WARRANTY

A Seagrave cab limited fifteen (15) year structural warranty shall be provided.

One (1)
91-50-030S

STAINLESS-STEEL BODY FIFTEEN YEAR STRUCTURAL LIMITED WARRANTY

A Seagrave limited stainless-steel body fifteen (15) year structural warranty shall be provided.

One (1)
91-50-0510

CHASSIS FRAME RAIL & CROSS MEMBER STRUCTURAL LIMITED LIFETIME WARRANTY

A Seagrave limited lifetime frame rail and cross members structural warranty shall be provided.

One (1)
91-50-0600

PAINT/CORROSION LIMITED WARRANTY

A Seagrave limited pro-rated paint six (6) year warranty shall be provided.

One (1)
91-50-0700

PUMP PLUMBING LIMITED WARRANTY

A Seagrave limited stainless-steel pump plumbing ten (10) year warranty shall be provided.

One (1)
92-00-1000

WEIGHT ANALYSIS - LOOSE EQUIPMENT

It shall be the responsibility of the purchaser to specify the details of the apparatus; its required performance, including where operations at elevations above 2000 ft (610m) or on grades greater than 6 percent are required; the maximum number of fire fighters to ride within the apparatus; specific added continuous electrical loads which exceed the minimum of this standard; and any hose, ground ladders, or equipment to be carried by the apparatus that exceed the minimum requirements of this standard.

One (1)
98-50-500C

ELECTRONIC OPERATOR'S & PARTS MANUAL

A binder shall be supplied that has electronic copies and paper documents as listed below.

The binder shall contain 2 duplicate electronic copies. Each electronic copy shall have:
- Operations & maintenance instructions for items on the vehicle, except all purchased components.
- Material Safety Data Sheets.
- Electrical diagrams including charts illustrating the individual wire color, number code, and function.
- Parts manuals.
- Parts drawings and an overall vehicle layout.
- Certificates
- Warranties

Printed documents shall include:
- Operations & maintenance instructions for items on the vehicle, not including the vendor literature
- Operations & maintenance instructions for engine.
- Certificates of independent test results.
- Warranty documents.
- Manufacturer's record of construction details and engine power curve.
- Vehicle final alignment report.
- Vendor literature provided by the manufacturer that arrives with the purchased component.

One (1) to two (2) manual electronic copies for the water pump shall be included, if there is a pump on the unit, and as provided by the pump manufacturer. Additional electronic copies, as provided by other equipment suppliers, shall also be included.

Wiring Diagrams are as Built, reference QW 22-00-0105.

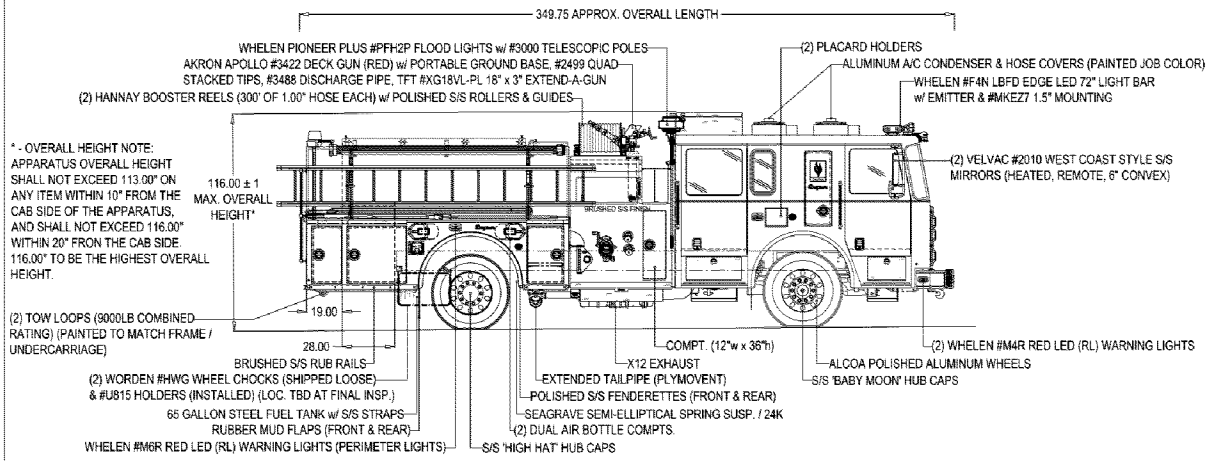
One (1)
99-00-0DFI

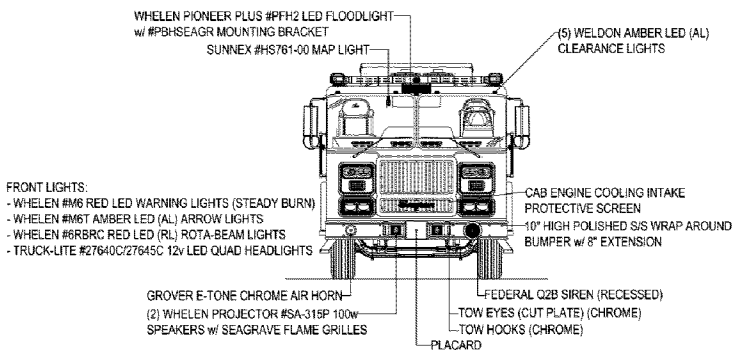
DEALER FURNISHED ITEMS

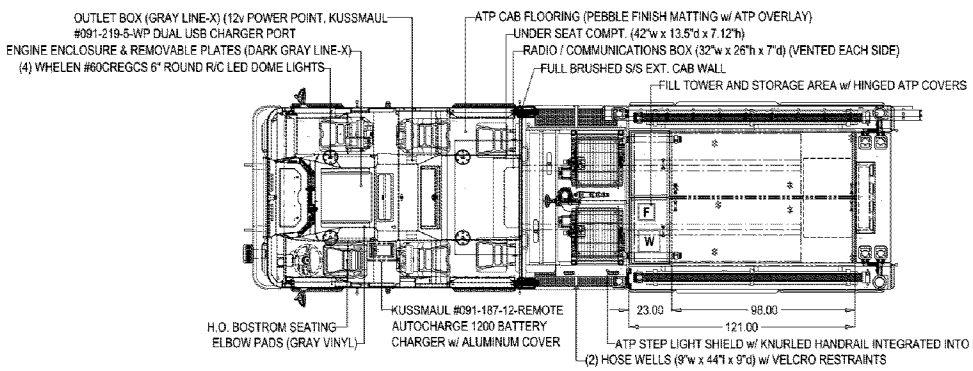
Derotic LLC will furnish the following items:

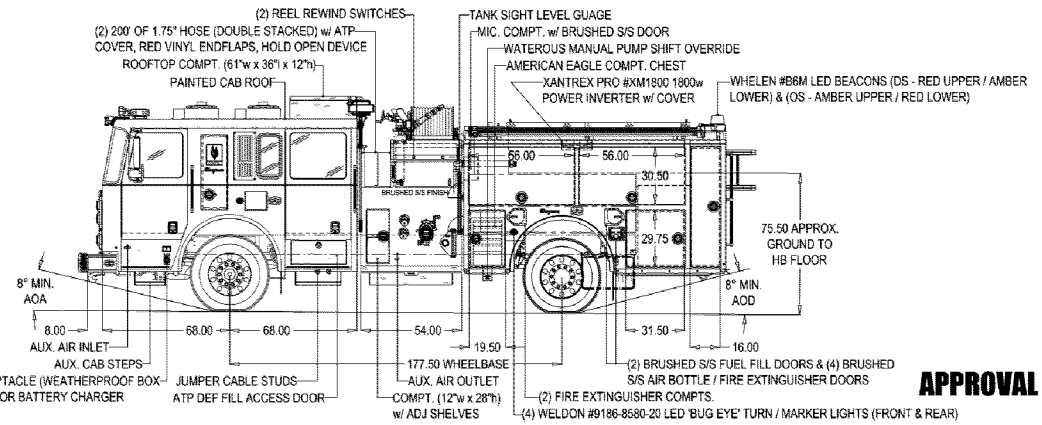
- Lettering and striping…as directed by the fire department.
- Intake fittings changed from 4" Storz to 4" NHF couplings.

- Auxiliary intake fittings from 2.5" NHM to 2.5" NHF couplings.
- 30 AMP Twist-lock shoreline to 20 AMP Auto-eject.
- The vehicle will be inspected and detailed prior to being delivered to the fire department.









FWD / Seagrave

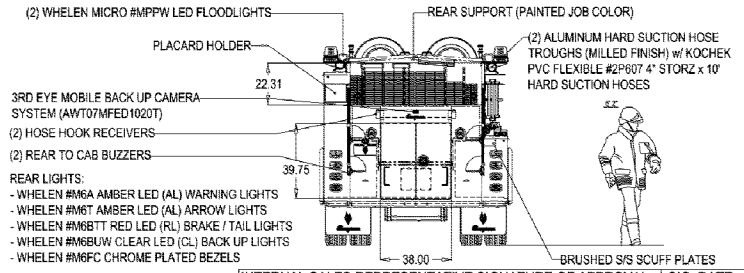
FWD SEAGRAVE HOLDINGS, LP / 105 EAST 12TH STREET
CLINTONVILLE, WI 54929

REDONDO BEACH FIRE DEPARTMENT
REDONDO BEACH, CA

PREPARED BY: DWL	DATE: 12-09-2020 | MODEL: DB50CT
CAB: CAPITOL 136	FRONT AXLE: MER / MFS / 20K / DISC
ENGINE: CUMMINS X12 500 HP	REAR AXLE: MER / RS23-186 / 24K / DISC
PUMP: WATEROUS CMU 1500 GPM / 2-STAGE	FRONT TIRES: MI / 315 / 80R22.5 / XZUS2
BODY: #3CR12 S/S / 121 (28) + BTC	REAR TIRES: MI / 11R22.5 / XDN2
TANK: 500 WATER / 20 FOAM / T	FOAM: FOAMPRO 2002

HOSE BED CAPACITY:
- 350' OF 1.75" HOSE (2 STACKS)
- 750' OF 3.00" HOSE (4 STACKS)
- 750' OF 3.00" HOSE (4 STACKS)
- 250' OF 2.50" HOSE (2 STACKS)
- 250' OF 1.75" HOSE (2 STACKS)
- (4) ADJ. PARTITIONS w/ HANDHOLDS
- ATP HOSE BED COVER
- RED VINYL END FLAPS
- BACKBOARD STORAGE (MOUNTED UNDER RS HOSE BED COVER)

LADDER STORAGE:
- DUO-SAFETY #900A 24' 2-SECTION LADDER (OUTBOARD)
- DUO-SAFETY #775A 14' ROOF LADDER (INBOARD)
- DUO-SAFETY #585A 10' FOLDING LADDER
- PVC PIKE POLE TUBES (2)
- FHU #RH-6 6' ROOF HOOK w/ STEEL HANDLE
- NUPLA #YPD-10 10' PIKE POLE w/ FIBERGLASS HANDLE
- PIKE POLE SHOE & CLIPS
- NUPLA #36-651-RH-6DA D-HANDLE RUBBISH HOOK



APPROVAL DRAWING

INTERNAL SALES REPRESENTATIVE SIGNATURE OF APPROVAL	SIG. DATE
PJW	02-09-2021

REV.	DATE	DESCRIPTION	REV. BY
-	12-10-2020	PRECON	DWL
1	02-09-2021	SOU1	DWL

ALL DIMENSIONS ARE MEASURED IN INCHES, UNLESS OTHERWISE NOTED.

THIS DRAWING IS FOR REFERENCE OF CONFIGURATION; MINOR DETAILS MAY NOT BE SHOWN. DIMENSIONS SHOWN ARE APPROXIMATE AND SUBJECT TO CHANGE. THE SALES ORDER AND APPROVED SALES ORDER CHANGES WILL PREVAIL, WHERE DISCREPANCIES EXIST.

THE INDICATED VEHICLE HEIGHT REPRESENTS A CALCULATED DIMENSION. ACTUAL SHIPPED HEIGHT MAY VARY.

THE HOSE CAPACITY IS A CALCULATED AMOUNT. ACTUAL CAPACITY MAY VARY DEPENDING ON VENDOR OF THE HOSE.

Exhibit “B”

S/O#

Seagrave Fire Apparatus, LLC

Two Year Limited Warranty

Limited Warranty

Subject to the limitations and exclusions set forth below, and provided the vehicle shall have been placed in service within sixty (60) days after delivery ("Warranty Start Date" or "WSD") to the original purchaser (the "Purchaser") as established by our original invoice, Seagrave Fire Apparatus, LLC ("Seagrave") warrants to the Purchaser that the portions of its custom cab and chassis that are manufactured by Seagrave ("Chassis or Custom Cab" or "Vehicle") shall be free from defects in material and workmanship for a warranty period ending two (2) years after the date of delivery of the vehicle to the original purchaser or the first 20,000 miles of use, or 10,000 hours as determined by engine hours or 10,000 In-Service hours, whichever occurs first ("Warranty Period").

Seagrave's obligation under this warranty is subject to the following conditions precedent: (a) Purchaser must notify Seagrave in writing of the claimed defect within thirty (30) days after the first date of discovery, but in any event prior to the expiration of the warranty period; (b) written approval must be obtained from Seagrave's Customer Service Manager prior to any repair or replacement of any materials covered within this Limited Warranty; (c) unless Seagrave directs otherwise, the claimed defective item(s) shall be returned to Seagrave, or to Seagrave's designee, promptly after the notification. Purchaser shall be responsible for the cost of transportation and for risk of loss or damage to the Vehicle or materials during transportation; (d) Seagrave reserves the right to thoroughly examine the Custom Cab or Chassis, or parts thereof, prior to conducting or approving any repair or replacement, to determine whether the claimed defect is covered by this warranty; (e) repair or replacement must be made by a facility approved in advance, in writing, by Seagrave. Failure to obtain all of the advance approvals voids this warranty. Coverage under this warranty of labor for repair or replacement is limited to the time or amounts reasonably necessary, as determined by Seagrave, to make the repair or replacement. Labor time or amounts deemed excessive by Seagrave are not covered under this warranty; and (f) this limited warranty shall apply only if the Vehicle is properly maintained in accordance with Seagrave's maintenance instructions and manuals and is used In Service, which is normal to the particular Vehicle model. Normal service means service, which does not subject the vehicle to stresses or impacts greater than those that normally result from the careful use of the Vehicle. All maintenance performed must be documented for proof of compliance. Such documentation must be made readily available and provided to Seagrave within ten (10) days upon request.

This warranty terminates upon transfer of possession or ownership of the vehicle from the original purchaser.

Notwithstanding anything to the contrary herein, Seagrave makes no warranty whatsoever as to: (a) any other integral parts, components, attachments or trade accessories of or to the vehicle that are not manufactured by Seagrave, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Seagrave shall assign to Purchaser the applicable warranties, if any, made by the respective manufacturers thereof; (b) the Chassis, Custom Cab or their components, any part, attachment or accessory damaged by misuse, neglect, improper maintenance or accident. Any determination of neglect or damage during the full limited warranty term will void this warranty; (c) the Chassis, Custom Cab or their components, any part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Seagrave which, in the sole judgment of Seagrave, adversely affects the performance, stability or purpose for which it was manufactured; (d) any modification or repair performed during the full term of the limited warranty excluding regular scheduled maintenance or the replacement of non-warrantable wearable components without prior written authorization from Seagrave will void this warranty; (e) products or parts which may, in the ordinary use, wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets, filters and light bulbs. Seagrave assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Seagrave; (f) normal maintenance services or adjustments, including but not limited to fuel system cleaning, wheel alignment and balancing, engine tune-up, brake inspection or adjustment, nor to the replacement of fluids, oil seals or filters.

Purchaser's Exclusive Remedy

If the Vehicle fails to conform to the warranty set forth in the limited warranty on this page during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Purchaser must notify Seagrave within the time period specified above and shall make the vehicle and all maintenance records available for inspection by Seagrave or its designated agent. At the request of Seagrave, any allegedly defective Vehicle shall be returned to Seagrave or an authorized Seagrave representative by the Purchaser for examination and/or repair. Purchaser shall be responsible for the cost of all such transportation including loading and unloading and for loss of or damage to the vehicle during transportation. Within a reasonable time, Seagrave shall repair or replace (at Seagrave's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance, in writing, by Seagrave. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

Exclusion of Consequential and Incidental Damages

Notwithstanding anything to the contrary herein or in any agreement between Seagrave and Purchaser, IN NO EVENT SHALL SEAGRAVE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY SEAGRAVE OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER SEAGRAVE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Seagrave specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Disclaimer of Warranties

THE WARRANTY SET FORTH IN THE PREVIOUS PARAGRAPHS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SEAGRAVE. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND WARRANTIES ARISING BY OPERATION OF LAW, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE.

NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTIES ON BEHALF OF SEAGRAVE FIRE APPARATUS, LLC, OTHER THAN AS SET FORTH HEREIN. ANY MODIFICATION TO THIS WARRANTY MUST BE IN WRITING AND APPROVED AND SIGNED BY THE CEO OF SEAGRAVE FIRE APPRATUS, LLC.

Seagrave reserves the right to make changes to Seagrave's products without incurring any obligation to modify or improve previously manufactured products.

Note: Any Surety Bond, if part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Seagrave Limited Warranty for such vehicle, and not to other warranties made by Seagrave in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Seagrave) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.

Seagrave Fire Apparatus, LLC

CAB

Fifteen Year Structural Integrity Limited Warranty

Seagrave Fire Apparatus, LLC ("Seagrave") warrants the cab tubular support and mounting structures and other structural components, as identified in Seagrave's specifications, of the cab ("Cab") of each new custom fire and rescue vehicle, so equipped and manufactured by Seagrave, to be free of structural failures caused by defective materials or workmanship for a warranty period equal to fifteen (15) years after the date on which the vehicle is first delivered ("Warranty Start Date" or "WSD") to the original purchaser ("Purchaser") or 100,000 miles, whichever occurs first.

This warranty terminates upon transfer of possession or ownership of the vehicle from the original purchaser.

Seagrave's obligation under this warranty is limited to repairing or replacing, as Seagrave may elect, without charge to the original purchaser, the structural component or components which Seagrave, after examination, finds, to Seagrave's satisfaction, to have structurally failed due to defective design or workmanship. This warranty is limited to the cab tubular support and mounting structures and to the other structural components, as identified in Seagrave's specifications, of the cab

Seagrave's obligation under this warranty is subject to the following conditions precedent: (a) that the claimed failure shall have first appeared during the warranty period; (b) that the original purchaser shall have notified Seagrave in writing of the claimed failure within thirty (30) days after the first date of discovery, but in any event prior to the expiration of the warranty period; (c) that, unless Seagrave directs otherwise, the claimed failed item or items shall have been returned to Seagrave, or to Seagrave's designee, promptly after the notification, with transportation charges prepaid; (d) Seagrave reserves the right to thoroughly examine the vehicle or parts thereof, prior to conducting or approving any repair or replacement, to determine whether the claimed failure is covered by this warranty; (e) in advance of the original purchaser effecting repair or replacement of a structural component or components found by Seagrave to have structurally failed due to defective design or workmanship, written approval for the repair or replacement must be obtained from Seagrave's Manager Customer Service or the CEO; (f) repair or replacement must be made by a facility approved in advance by Seagrave. Failure to obtain all of the advance approvals voids this warranty; and (g) coverage under this warranty of labor for repair or replacement is limited to the time or amounts reasonably necessary, as determined by Seagrave, to make the repair or replacement. Labor time or amounts deemed excessive by Seagrave are not covered under this warranty.

This warranty does not apply to or cover: (a) normal maintenance services or adjustments; (b) any item that has been repaired, replaced or altered by a facility not approved in advance, in writing, by Seagrave's Customer Service Department, or in a manner which, in Seagrave's judgment, may adversely affect the operation or longevity of the vehicle or item; (c) integral parts, components, aftermarket or trade accessories not manufactured by Seagrave; (d) special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, or lost profits; (e) any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge or normal maintenance or adjustments; (f) time required to unload or reload the vehicle or item; (g) nonstructural breakage or cracking; (h) material bending, buckling or other metal deformation unless caused by a structural failure of a structural component, as identified in Seagrave's specifications, of the Cab due to defective design or workmanship; (i) transportation fees or charges to or from any facility; or (j) defects if the Cab is damaged, dented, scratched, corroded or rusted from severe salt or road corrosive materials; faded or discolored by exposure to heat or severe sun conditions or environmental conditions.

This warranty is void if Seagrave determines that the Cab has been neglected, misused, altered, overloaded, loaded to a state of excessive imbalance side-to-side, or damaged. This warranty is also void if Seagrave determines that the warranty claim is false or misrepresented, that the Cab has been damaged in an accident or by an act of God, or that the structural failure is attributable to use or operation of the vehicle or item in a manner or for a purpose other than that for which Seagrave intended or designed the Cab.

Purchaser's Exclusive Remedy

If the Cab fails to conform to the warranty set forth in the limited warranty on this page during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Purchaser must notify Seagrave within the time period specified above and shall make the Cab and all maintenance records available for inspection by Seagrave or its designated agent. At the request of Seagrave, any allegedly defective Cab shall be returned to Seagrave or an authorized Seagrave representative by the Purchaser for examination and/or repair. Purchaser shall be responsible for the cost of all such transportation including loading and unloading and for loss of or damage to the vehicle during transportation. Within a reasonable time, Seagrave shall repair or replace (at Seagrave's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance, in writing, by Seagrave. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

Exclusion of Consequential and Incidental Damages

Notwithstanding anything to the contrary herein or in any agreement between Seagrave and Purchaser, IN NO EVENT SHALL SEAGRAVE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY SEAGRAVE OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER SEAGRAVE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Seagrave specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Disclaimer of Warranties

THE WARRANTY SET FORTH IN THE PREVIOUS PARAGRAPHS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SEAGRAVE. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND WARRANTIES ARISING BY OPERATION OF LAW, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTIES ON BEHALF OF SEAGRAVE FIRE APPARATUS, LLC, OTHER THAN AS SET FORTH HEREIN ANY MODIFICATION TO THIS WARRANTY MUST BE IN WRITING AND APPROVED AND SIGNED BY THE CEO OF SEAGRAVE FIRE APPARATUS, LLC.

Seagrave reserves the right to make changes to Seagrave's products without incurring any obligation to modify or improve previously manufactured products.

NOTE Surety bond, if required, applies only to Seagrave's Basic Limited Warranty, and not to this or any other or extended warranty made by Seagrave or any of Seagrave's suppliers.

S/O#

Seagrave Fire Apparatus, LLC

Stainless Steel Body

Fifteen Year Structural Integrity Limited Warranty

Seagrave Fire Apparatus, LLC ("Seagrave") warrants the body tubular support and mounting structures and other structural components, as identified in Seagrave's specifications of the stainless steel body ("Body") of each new custom fire and rescue vehicle, so equipped and manufactured by Seagrave, to be free of structural failures caused by defective materials or workmanship for a warranty period of fifteen (15) years after the date on which the vehicle is first delivered ("Warranty Start Date" or "WSD") to the original purchaser ("Purchaser") or 100,000 miles, whichever comes first.

This warranty terminates upon transfer of possession or ownership of the vehicle from the original purchaser.

Seagrave's obligation under this warranty is limited to repairing or replacing, as Seagrave may elect, without charge to the original purchaser, the structural component or components which Seagrave, after examination, finds, to Seagrave's satisfaction, to have structurally failed due to defective design or workmanship.

Seagrave's obligation under this warranty is subject to the following conditions precedent: (a) that the claimed failure shall have first appeared during the warranty period; (b) that the original purchaser shall have notified Seagrave in writing of the claimed failure within thirty (30) days after the first date of discovery, but in any event prior to the expiration of the warranty period; (c) that, unless Seagrave directs otherwise, the claimed failed item or items shall have been returned to Seagrave, or to Seagrave's designee, promptly after the notification, with transportation charges prepaid; (d) Seagrave reserves the right to thoroughly examine the vehicle or parts thereof, prior to conducting or approving any repair or replacement, to determine whether the claimed failure is covered by this warranty; (e) in advance of the original purchaser effecting repair or replacement of a structural component or components found by Seagrave to have structurally failed due to defective design or workmanship, written approval for the repair or replacement must be obtained from Seagrave's Manager Customer Service or the CEO; (f) repair or replacement must be made by a facility approved in advance by Seagrave. Failure to obtain all of the advance approvals voids this warranty; and (g) coverage under this warranty of labor for repair or replacement is limited to the time or amounts reasonably necessary, as determined by Seagrave, to make the repair or replacement. Labor time or amounts deemed excessive by Seagrave are not covered under this warranty.

This warranty does not apply to or cover: (a) normal maintenance services or adjustments; (b) any item that has been repaired, replaced or altered by a facility not approved in advance, in writing, by Seagrave's Customer Service Department, or in a manner which, in Seagrave's judgment, may adversely affect the operation or longevity of the vehicle or item; (c) integral parts, components, aftermarket or trade accessories not manufactured by Seagrave; (d) special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, or lost profits; (e) any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge or normal maintenance or adjustments; (f) time required to unload or reload the vehicle or item; (g) nonstructural breakage or cracking; (h) material bending, buckling or other metal deformation unless caused by a structural failure of a structural component (fatigued sheet metal is NOT considered structural), as identified in Seagrave's specifications, of the Body due to defective design or workmanship; (i) transportation fees or charges to or from any facility; or (j) defects if the Body is damaged, dented, scratched, corroded or rusted from severe salt or road corrosive materials; faded or discolored by exposure to heat or severe sun conditions or environmental conditions.

This warranty is void if Seagrave determines that the Body has been neglected, misused, altered, overloaded, loaded to a state of excessive imbalance side to side, or damaged. This warranty is also void if Seagrave determines that the warranty claim is false or misrepresented, that the Body has been damaged in an accident or by an act of God, or that the structural failure is attributable to use or operation of the vehicle or item in a manner or for a purpose other than that for which Seagrave intended or designed the Body.

Purchaser's Exclusive Remedy

If the Body fails to conform to the warranty set forth in the limited warranty on this page during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Purchaser must notify Seagrave within the time period specified above and shall make the Body and all maintenance records available for inspection by Seagrave or its designated agent. At the request of Seagrave, any allegedly defective Body shall be returned to Seagrave or an authorized Seagrave representative by the Purchaser for examination and/or repair. Purchaser shall be responsible for the cost of all such transportation including loading and unloading and for loss of or damage to the vehicle during transportation. Within a reasonable time, Seagrave shall repair or replace (at Seagrave's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance, in writing, by Seagrave. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

Exclusion of Consequential and Incidental Damages

Notwithstanding anything to the contrary herein or in any agreement between Seagrave and Purchaser, IN NO EVENT SHALL SEAGRAVE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY SEAGRAVE OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER SEAGRAVE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Seagrave specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Disclaimer of Warranties

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Seagrave reserves the right to make changes to Seagrave's products without incurring any obligation to modify or improve previously manufactured products

NOTE Surety bond, if required, applies only to Seagrave's Basic Limited Warranty, and not to this or any other or extended warranty made by Seagrave or any of Seagrave's suppliers.

S/O#

Seagrave Fire Apparatus, LLC

CHASSIS FRAME RAIL & CROSSMEMBERS

Structural Integrity Limited Lifetime Warranty

Seagrave Fire Apparatus, LLC ("Seagrave") warrants each new chassis frame rail and crossmember manufactured by Seagrave ("Frame Rail and Crossmember") of each new custom fire and rescue vehicle, so equipped and manufactured by Seagrave, to be free of structural failures caused by defective materials or workmanship for a warranty period equal to the vehicle's useful life (twenty (20) years or 100,000 miles) after the date on which the vehicle is first delivered ("Warranty Start Date" or "WSD") to the original purchaser ("Purchaser").

This warranty terminates upon transfer of possession or ownership of the vehicle from the original purchaser.

Seagrave's obligation under this warranty is limited to repairing or replacing, as Seagrave may elect, without charge to the original purchaser, the structural component or components which Seagrave, after examination, finds, to Seagrave's satisfaction, to have structurally failed due to defective design or workmanship.

Seagrave's obligation under this warranty is subject to the following conditions precedent: (a) that the claimed failure shall have first appeared during the warranty period; (b) that the original purchaser shall have notified Seagrave in writing of the claimed failure within thirty (30) days after the first date of discovery, but in any event prior to the expiration of the warranty period; (c) that, unless Seagrave directs otherwise, the claimed failed item or items shall have been returned to Seagrave, or to Seagrave's designee, promptly after the notification, with transportation charges prepaid; (d) Seagrave reserves the right to thoroughly examine the vehicle or parts thereof, prior to conducting or approving any repair or replacement, to determine whether the claimed failure is covered by this warranty; (e) in advance of the original purchaser effecting repair or replacement of a structural component or components found by Seagrave to have structurally failed due to defective design or workmanship, written approval for the repair or replacement must be obtained from Seagrave's Manager Customer Service or the CEO; (f) repair or replacement must be made by a facility approved in advance by Seagrave. Failure to obtain all of the advance approvals voids this warranty; (g) coverage under this warranty of labor for repair or replacement is limited to the time or amounts reasonably necessary, as determined by Seagrave, to make the repair or replacement. Labor time or amounts deemed excessive by Seagrave are not covered under this warranty; and (h) the Frame Rail and Cross Member bolts must be inspected and serviced, including re-torqueing or replacement if needed, annually at the customer's expanse by an Authorized Service Representative in accordance with Seagrave's recommended procedures. Such annual inspection shall be performed within twelve months directly following the Warranty Start Date and each successive twelve months thereafter for the full term of the warranty. All documentation must be sent to Seagrave's Customer Service Department within thirty (30) days after the inspection; failure to submit such documentation will void this warranty.

This warranty does not apply to or cover: (a) normal maintenance services or adjustments; (b) any item that has been repaired, replaced or altered by a facility not approved in advance, in writing, by Seagrave's Customer Service Department, or in a manner which, in Seagrave's judgment, may adversely affect the operation or longevity of the vehicle or item; (c) integral parts, components, aftermarket or trade accessories not manufactured by Seagrave; (d) special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, or lost profits; (e) any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge or normal maintenance or adjustments; (f) time required to unload or reload the vehicle or item; (g) nonstructural breakage or cracking; (h) material bending, buckling or other metal deformation unless caused by a structural failure of a structural component, as identified in Seagrave's specifications, of the Frame Rail and Crossmember due to defective design or workmanship; (i) transportation fees or charges to or from any facility; or (j) defects if the Frame Rail and Crossmember is damaged, dented, scratched, corroded or rusted from severe salt or road corrosive materials; faded or discolored by exposure to heat or severe sun conditions or environmental conditions.

This warranty is void if Seagrave determines that the Frame Rail and Crossmember has been neglected, misused, altered, overloaded, loaded to a state of excessive imbalance side-to-side, or damaged. This warranty is also void if Seagrave determines that the warranty claim is false or misrepresented, that the Frame Rail and Crossmember has been damaged in an accident or by an act of God, or that the structural failure is attributable to use or operation of the vehicle or item in a manner or for a purpose other than that for which Seagrave intended or designed the Frame Rail and Crossmember.

Purchaser's Exclusive Remedy

If the Frame Rail and Crossmember fails to conform to the warranty set forth in the limited warranty on this page during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Purchaser must notify Seagrave within the time period specified above and shall make the Frame Rail and Crossmember and all maintenance records available for inspection by Seagrave or its designated agent. At the request of Seagrave, any allegedly defective Frame Rail and Crossmember shall be returned to Seagrave or an authorized Seagrave representative by the Purchaser for examination and/or repair. Purchaser shall be responsible for the cost of all such transportation including loading and unloading and for loss of or damage to the vehicle during transportation. Within a reasonable time, Seagrave shall repair or replace (at Seagrave's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in, advance in, writing by Seagrave. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

Exclusion of Consequential and Incidental Damages

Notwithstanding anything to the contrary herein or in any agreement between Seagrave and Purchaser, IN NO EVENT SHALL SEAGRAVE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY SEAGRAVE OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER SEAGRAVE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Seagrave specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Disclaimer of Warranties

THE WARRANTY SET FORTH IN THE PREVIOUS PARAGRAPHS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SEAGRAVE. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND WARRANTIES ARISING BY OPERATION OF LAW, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTIES ON BEHALF OF SEAGRAVE FIRE APPARATUS, LLC, OTHER THAN AS SET FORTH HEREIN. ANY MODIFICATION TO THIS WARRANTY MUST BE IN WRITING AND APPROVED AND SIGNED BY THE CEO OF SEAGRAVE FIRE APPARATUS, LLC.

Seagrave reserves the right to make changes to Seagrave's products without incurring any obligation to modify or improve previously manufactured products.

NOTE: Surety bond, if required, applies only to Seagrave's Basic Limited Warranty, and not to this or any other or extended warranty made by Seagrave or any of Seagrave's suppliers.

S/O#

Seagrave Fire Apparatus, LLC

PAINT/CORROSION

Six Year Limited Warranty

Subject to the limitations and exclusions set forth below, Seagrave Fire Apparatus, LLC ("Seagrave") warrants the exterior paint on each new cab and body manufactured by Seagrave for a period of six (6) years after the date on which the vehicle is first delivered ("Warranty Start Date" or "WSD") to the original purchaser ("Purchaser") as established by Seagrave's original invoice. Seagrave warrants the Purchaser that its finished cab and body ("Cab and Body") areas will be free from corrosion, blistering, peeling, or any other adhesion defect caused by defective manufacturing methods or paint material selection for exterior surfaces of the body of the vehicle.

Seagrave's obligation under this warranty is subject to the conditions precedent: (a) Original Purchaser must notify Seagrave in writing of the claimed defect or perforation within thirty (30) days of discovery, but in any event prior to the expiration of the warranty period; (b) written approval must be obtained from Seagrave's Customer Service Manager prior to any repair or replacement of any materials covered within this Limited Warranty; (c) unless Seagrave directs otherwise, the claimed defective or perforated item(s) shall be returned to Seagrave, or to Seagrave's designee, promptly after the notification. Original Purchaser shall be responsible for the cost of transportation and for risk of loss or damage to the vehicle or materials during transportation; (d) Seagrave reserves the right to thoroughly examine the vehicle or parts thereof, prior to conducting or approving any repair or replacement, to determine whether the claimed defect or perforation is covered by this warranty; (e) repair or replacement must be made by a facility approved in advance, in writing, by Seagrave. Failure to obtain all of the advance approvals voids this warranty. Coverage under this warranty of labor for repair or replacement is limited to the time or amounts reasonably necessary, as determined by Seagrave, to make the repair or replacement. Labor time or amounts deemed excessive by Seagrave are not covered under this warranty; (f) the Cab and Body exterior must be properly maintained; and (g) the Cab and Body exterior must be inspected and serviced annually at the customer's expanse by an Authorized Service Representative in accordance with Seagrave's recommended procedures. Such annual inspection shall be performed within twelve months directly following the Warranty Start Date and each successive twelve months thereafter for the full term of the warranty. All documentation must be sent to Seagrave's Customer Service Department within thirty (30) days after the inspection; failure to submit such documentation will void this warranty.
This warranty terminates upon transfer of possession or ownership of the vehicle from the original purchaser.

This Limited Warranty is applicable to the vehicle in the following percentage costs of warranty repair, if any:

Period	Portion of Cost Covered
0 -24 Months	100%
25 -36 Months	80%
37 -48 Months	60%
49 -60 Months	40%
61 -72 Months	20%

Seagrave also warrants, subject to all of the terms and conditions of this Limited Warranty, except cost allocations, each new Cab and Body manufactured by Seagrave against exterior corrosion perforation for a warranty period of six (6) years after the date on which the vehicle is first delivered to the original purchaser or 100,000 miles, whichever occurs first

This limited warranty covers only repair or replacement of any part of a Seagrave vehicle in which a defect in materials or workmanship appears within the limited warranty period This warranty is void if Seagrave determines that the warranty claim is false or misrepresented.

Examples of items not covered include, but are not limited to:

I. Major components or trade accessories such as purchased chassis, engines, signaling devices, batteries, generators, tires, rims or transmissions that have a separate warranty by the original manufacturer, or to equipment used in firefighting.
II. An unauthorized alteration or modification to the vehicle, including the body, chassis or components, after completion of the vehicle assembly by Seagrave and any problems that occur as a result of such alterations or modifications.
III. Damage caused by collision, fire, theft, freezing, vandalism, riot, explosion, acts of nature, war or objects striking the vehicle or any damage covered by owner insurance.
IV. Damage caused by misuse, neglect or improper operation of the vehicle such as driving over curbs, overloading, racing or off–road use.
V. Corrosion caused by exposed sheet metal, accidents, or normal wear and tear are not defects in material or workmanship
VI. Damage caused by failure to follow the requirements of the maintenance schedule, failure to maintain proper fluid and lubricant levels and failure to follow operating instructions.
VII. Incidental expenses such as loss of vehicle use, inconvenience, loss of time, vehicle rental, loading or travel costs, vacation pay, liability for personal or property damages, penalties, damages for lost profits or revenues, any other types of economic loss or any third party claims for damages.
VIII. Gold leaf, striping, exotic and/or custom finishes and Scotchlite emblems or decals installed by anyone other than the Seagrave factory.
IX. Damage caused from exposure to road de-icing compounds or use in an acidic environment.
X. Normal paint deterioration due to exposure
XI. Damage caused from not following cab and body washing procedures on truck and in Operation and Maintenance Manual.
XII. Defects if vehicle is damaged, dented, scratched, corroded or rusted from severe salt or road corrosive materials, or faded or discolored by exposure to heat or severe sun conditions or environmental conditions.
XIII. This warranty shall not apply to non-exterior surface areas (i.e. compartment interiors, cab and body interior, undercarriages)
XIV. This warranty shall only apply to exterior coating applied by Seagrave and specifically excludes all coating applications applied by other manufacturers including chassis and chassis compartments.
XV This warranty shall exclude accessory vendor equipment that is painted to match finished vehicle.
XVI This warranty shall exclude painted roll-up doors.
XVII Hazing, chalking or loss of gloss caused by improper care, abrasive polishes, cleaning agents, heavy duty pressure washing or aggressive mechanical wash system.
XVIII Paint deterioration caused by abuse, accidents, acid rain, chemical fallout or acts of nature.
XIX Accidents, scratches, chips, bruises, and gloss reduction or blemishes due to normal vehicle use and maintenance.

Purchaser's Exclusive Remedy

If the Cab and Body fails to conform to the warranty set forth in the limited warranty on this page during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Purchaser must notify Seagrave within the time period specified above and shall make the vehicle and all maintenance records available for inspection by Seagrave or its designated agent. At the request of Seagrave, any allegedly defective Cab and Body shall be returned to Seagrave or an authorized Seagrave representative by the Purchaser for examination and/or repair. Purchaser shall be responsible for the cost of all such transportation including loading and unloading and for loss of or damage to the vehicle during transportation. Within a reasonable time, Seagrave shall repair or replace (at Seagrave's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance, in writing, by Seagrave. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

Exclusion of Consequential and Incidental Damages

Notwithstanding anything to the contrary herein or in any agreement between Seagrave and Purchaser, IN NO EVENT SHALL SEAGRAVE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY SEAGRAVE OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER SEAGRAVE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Seagrave specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Disclaimer of Warranties

THE WARRANTY SET FORTH IN THE PREVIOUS PARAGRAPHS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SEAGRAVE. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND WARRANTIES ARISING BY OPERATION OF LAW, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTIES ON BEHALF OF SEAGRAVE FIRE APPARATUS, LLC, OTHER THAN AS SET FORTH HEREIN. ANY MODIFICATION TO THIS WARRANTY MUST BE IN WRITING AND APPROVED AND SIGNED BY THE CEO OF SEAGRAVE FIRE APPRATUS, LLC.

Seagrave reserves the right to make changes to Seagrave's products without incurring any obligation to modify or improve previously manufactured products.

NOTE: Surety bond, if required, applies only to Seagrave Basic Limited Warranty, and not to this or any other warranty made by Seagrave or any of Seagrave's suppliers.

S/O#

Seagrave Fire Apparatus, LLC

STAINLESS STEEL PUMP PLUMBING

TEN YEAR LIMITED WARRANTY

Seagrave Fire Apparatus, LLC ("Seagrave") warrants the stainless steel pump plumbing of each new custom fire and rescue vehicle, so equipped and manufactured by Seagrave, to be free of structural failures caused by defective materials or workmanship for a warranty period of ten (10) years after the date on which the vehicle is first delivered ("Warranty Start Date" or "WSD") to the original purchaser ("Purchaser").
This warranty is limited to the schedule 10 stainless steel piping and attached fittings, as identified in Seagrave's specifications, of the pump plumbing ("Stainless Steel Plumbing").

This warranty terminates upon transfer of possession or ownership of the vehicle or Stainless Steel Plumbing from the original purchaser.

Seagrave's obligation under this warranty is limited to repairing or replacing, as Seagrave may elect, without charge to the original purchaser, the pump plumbing component or components which Seagrave, after examination, finds, to Seagrave's satisfaction, to have structurally failed due to defective design or workmanship.

Seagrave's obligation under this warranty is subject to the following conditions precedent: (a) that the claimed failure shall have first appeared during the warranty period; (b) that the original purchaser shall have notified Seagrave in writing of the claimed failure within thirty (30) days after the first date of discovery, but in any event prior to the expiration of the warranty period; (c) that, unless Seagrave directs otherwise, the claimed failed item or items shall have been returned to Seagrave, or to Seagrave's designee, promptly after the notification, with transportation charges prepaid; (d) Seagrave reserves the right to thoroughly examine the vehicle or parts thereof, prior to conducting or approving any repair or replacement, to determine whether the claimed failure is covered by this warranty; (e) in advance of the original purchaser effecting repair or replacement of a structural component or components found by Seagrave to have structurally failed due to defective design or workmanship, written approval for the repair or replacement must be obtained from Seagrave's Manager Customer Service or the CEO; (f) repair or replacement must be made by a facility approved in advance by Seagrave. Failure to obtain all of the advance approvals voids this warranty; and (g) coverage under this warranty of labor for repair or replacement is limited to the time or amounts reasonably necessary, as determined by Seagrave, to make the repair or replacement. Labor time or amounts deemed excessive by Seagrave are not covered under this warranty.

This warranty does not apply to or cover: (a) normal maintenance services or adjustments; (b) any item that has been repaired, replaced or altered by a facility not approved in advance, in writing, by Seagrave's Customer Service Department, or in a manner which, in Seagrave's judgment, may adversely affect the operation or longevity of the vehicle or item; (c) integral parts, components, aftermarket or trade accessories not manufactured by Seagrave; (d) special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, or lost profits; (e) any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge or normal maintenance or adjustments; (f) time required to unload or reload the vehicle or item; (g) nonstructural breakage or cracking; (h) material bending, buckling or other metal deformation unless caused by a structural failure of a structural component, as identified in Seagrave's specifications, of the Stainless Steel Plumbing due to defective design or workmanship; (i) transportation fees or charges to or from any facility; or (j) defects if the Stainless Steel Plumbing is damaged, dented, scratched, corroded or rusted from severe salt or road corrosive materials; faded or discolored by exposure to heat or severe sun conditions or environmental conditions.

This warranty is void if Seagrave determines that the Stainless Steel Plumbing has been neglected, misused, altered, overloaded, loaded to a state of excessive imbalance side-to-side, or damaged. This warranty is also void if Seagrave determines that the warranty claim is false or misrepresented, that the Stainless Steel Plumbing has been damaged in an accident or by an act of God, or that the structural failure is attributable to use or operation of the vehicle or item in a manner or for a purpose other than that for which Seagrave intended or designed the Stainless Steel Plumbing.

Purchaser's Exclusive Remedy

If the Stainless Steel Plumbing fails to conform to the warranty set forth in the limited warranty on this page during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Purchaser must notify Seagrave within the time period specified above and shall make the Stainless Steel Plumbing and all maintenance records available for inspection by Seagrave or its designated agent. At the request of Seagrave, any allegedly defective Stainless Steel Plumbing shall be returned to Seagrave or an authorized Seagrave representative by the Purchaser for examination and/or repair. Purchaser shall be responsible for the cost of all such transportation including loading and unloading and for loss of or damage to the vehicle during transportation. Within a reasonable time, Seagrave shall repair or replace (at Seagrave's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance, in writing, by Seagrave. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

Exclusion of Consequential and Incidental Damages

Notwithstanding anything to the contrary herein or in any agreement between Seagrave and Purchaser, IN NO EVENT SHALL SEAGRAVE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY SEAGRAVE OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS, OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER SEAGRAVE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Seagrave specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Disclaimer of Warranties

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Seagrave reserves the right to make changes to Seagrave's products without incurring any obligation to modify or improve previously manufactured products.
NOTE Surety bond, if required, applies only to Seagrave's Basic Limited Warranty, and not to this or any other or extended warranty made by Seagrave or any of Seagrave's suppliers.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/27/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Sara Schmidt
Hays Companies Inc. 1200 North Mayfair Road Suite #100 Milwaukee WI 53226	PHONE (A/C, No, Ext): (414)443-0000 FAX (A/C, No): E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: Hartford Fire Insurance Company	19682
INSURER B: Travelers Property Cas Co of America	25674
INSURER C:	
INSURER D:	
INSURER E:	
INSURER F:	

INSURED
Seagrave Fire Apparatus, LLC
105 E. 12th Street
Clintonville WI 54929

COVERAGES **CERTIFICATE NUMBER:** 22-23 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☒ LOC ☐ OTHER:			83 UEN OK9956	6/1/2022	6/1/2023	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 300,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
B	AUTOMOBILE LIABILITY X ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS			TJ-CAP-8E090058-TIL-23	1/1/2023	1/1/2024	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
	☐ UMBRELLA LIAB ☐ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☐ RETENTION $						EACH OCCURRENCE AGGREGATE	$ $
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N ☐ N/A (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			UB-1L956215-23-51-H	1/1/2023	1/1/2024	X PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 500,000 $ 500,000 $ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

Evidence of Insurance

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

James Hays/MOJONE