

# CAMPBELL COUNTY FIRE DEPT. GILLETTE WYOMING TYPE 3 ENGINE, SVI#1103-1104

## Production Specification

Contract Administrator: Jackie Sipes  
Sales Administrator: Jason Kline



**ROCK SOLID QUALITY**

# Campbell County Fire Department

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## **INTERNET IN-PROCESS SITE**

The manufacturer shall post and maintain a website where the Campbell County Fire Department will be able to view digital images of their apparatus as its being built. The digital images shall be posted once a week starting when the body begins production or when the cab/chassis arrives and shall continue until the final completion of unit.

## **FIRE APPARATUS PERFORMANCE**

The fire apparatus shall meet the requirements of this standard at elevations of 2000 ft (600 m) above sea level.

The fire apparatus shall meet all the requirements of this standard while stationary on a grade of 6 percent in any direction.

The fire apparatus shall meet the requirements of this standard in ambient temperature conditions between 32°F (0°C) and 110°F (43°C).

## **HIGHWAY PERFORMANCE**

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

- 1) Accelerating from 0 to 35 mph (55 km/hr) within 25 seconds on a 0 percent grade
- 2) Attaining a speed of 50 mph (80 km/hr) on a 0 percent grade
- 3) Maintaining a speed of at least 20 mph (32 km/hr) on any grade up to and including 6 percent

The maximum top speed of fire apparatus will be approx. 75 MPH. Campbell County Fire Department understands this is outside the NFPA standard and will sign a waiver regarding this section.

## **SERVICEABILITY**

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

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

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

## **FIRE APPARATUS DOCUMENTATION**

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

- 1) The manufacturers record of apparatus construction details, including the following documents:
  - a) Owner's name and address
  - b) Apparatus manufacturer, model, and serial number
  - c) Chassis make, model, and serial number
  - d) GAWR of front and rear axles and GVWR
  - e) Front tire size and total rated capacity in pounds (kilograms)
  - f) Rear tire size and total rated capacity in pounds (kilograms)

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- g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
  - h) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
  - i) Type of fuel and fuel tank capacity
  - j) Electrical system voltage and alternator output in amps
  - k) Battery make, model, and capacity in cold cranking amps (CCA)
  - l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
  - m) Ratios of all driving axles
  - n) Maximum governed road speed
  - o) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), maximum discharge pressure capability rating, and serial number
  - p) Pump transmission make, model, serial number, and gear ratio
  - q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - r) Water tank certified capacity in gallons or liters
  - s) Foam tank (if provided) certified capacity in gallons (liters)
  - t) Aerial device type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
  - u) Paint manufacturer and paint number(s)
  - v) Company name and signature of responsible company representative
  - w) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
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- 2) Certification of compliance of the optical warning system (*see 13.8.16*)
  - 3) Siren manufacturer's certification of the siren (*see 13.9.1.1*)
  - 4) Written load analysis and results of the electrical system performance tests (*see 13.14.1 and Section 13.15*)
  - 5) Certification of slip resistance of all stepping, standing, and walking surfaces (*see 15.7.4.5*)
  - 6) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability (*see 16.2.4.1*)
  - 7) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions (*see 16.2.4.2*)
  - 8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications (*see 16.3.1*)
  - 9) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed (*see 16.3.2.2*)
  - 10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test (*see 16.5.2.2*)
  - 11) If the apparatus has a fire pump with a maximum discharge pressure capability rating that exceeds the hydrostatic test pressure of 16.5.2.1, the pump manufacturer's certification of the hydrodynamic test
  - 12) If the apparatus has a fire pump, the certification of inspection and test for the fire pump (*see 16.13.1.1.5 or 16.13.1.2.4 as applicable*)
  - 13) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test (*see Section 17.13*)
  - 14) When the apparatus is equipped with a water tank, the certification of water tank capacity (*see Section 18.6*)
  - 15) If the apparatus has an aerial device, the certification of inspection and test for the aerial device (*see Section 19.24*)
  - 16) If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911
  - 17) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy (*see 20.10.4.2*) and the final installer's certification the foam proportioning system meets this standard (*see 20.11.2*)
  - 18) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests (*see Section 21.9*)
  - 19) If the apparatus has a line voltage power source, the certification of the test for the power source (*see 22.15.7.2*)

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- 20) If the apparatus is equipped with an air system, air tank certificates (see 24.5.1.2), the SCBA fill station certification (see 24.9.6), and the results of the testing of the air system installation (see 24.14.5 and 24.15.4)
- 21) Any other required manufacturer test data or reports

### **OPERATIONS AND SERVICE DOCUMENTATION**

The contractor shall deliver with the fire apparatus complete operation and service documentation covering the completed apparatus as delivered and accepted.

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

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

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

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

### **NFPA REQUIRED DOCUMENTATION FORMAT - USB FLASH DRIVE**

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

There shall be one (1) printed copies of the manual provided with the apparatus.

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## **FIRE APPARATUS SAFETY GUIDE**

A Fire Apparatus Safety Guide published by Fire Apparatus manufacturer's Association shall be provided with delivered vehicle. This manual includes essential safety information for fire fighters, fire chiefs, apparatus mechanics, and fire department safety officers. The guide is applicable to municipal, wildland, and airport fire fighting apparatus manufactured on either custom or commercial chassis.

## **STATEMENT OF EXCEPTIONS**

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

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

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

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

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## STATEMENT OF EXCEPTIONS

The Campbell County Fire Department specified emergency vehicle is NOT fully compliant with the latest NFPA 1901/1906 edition. Listed below are the noncompliant or missing required items that need to be changed to be become fully compliant with latest NFPA 1901/1906 edition;

<u>Change</u>				
<u>Item</u>	<u>Page</u>	<u>Current Description</u>	<u>Changed Description</u>	<u>Responsibility</u>
1		Top speed of 75 mph.	To meet NFPA, top speed must be 68 mph.	Campbell County Fire Dept.
2		Chevron color red and black.	To meet NFPA chevron diamond grade colors must be red and fluorescent yellow-green.	Campbell County Fire Dept.
3				
4				
5				

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

SVI Trucks  
3842 Redman Drive  
Fort Collins, CO 80524

\_\_\_\_\_  
Regional Sales Manager

Date: \_\_\_\_\_

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

\_\_\_\_\_  
On Behalf of Campbell County Fire Department

Date: \_\_\_\_\_

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## **CARRYING CAPACITY**

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

The estimated in-service weight shall include the following:

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

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

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

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

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

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

## **TESTING**

### **ROAD TEST**

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

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

The tests shall be conducted on dry, level, paved roads that are in good condition. The apparatus shall be loaded to its estimated in service weight.

The engine shall not operate in excess of the maximum governed speed. Acceleration tests shall consist of two runs in opposite directions over the same route. The fire apparatus shall attain a speed of 35 mph (55 km/hr) from a standing start within 25 seconds. The fire apparatus shall attain a minimum top speed of 50 mph (80 km/hr).

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

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

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

### **LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST**

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

### **TEST SEQUENCE**

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

#### **1. RESERVE CAPACITY TEST**

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

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

#### **2. ALTERNATOR PERFORMANCE TEST**

##### **TEST AT IDLE**

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

##### **TEST AT FULL LOAD**

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

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



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## **3. LOW VOLTAGE ALARM TEST**

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

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

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

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

## **LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST**

### **DOCUMENTATION**

The manufacturer shall deliver the following with the fire apparatus:

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

### **UL PUMP CERTIFICATION**

The apparatus upon completion shall be tested and certified by Underwriters Laboratories, Inc. (UL). The certification tests shall follow the guide lines outlined in NFPA 1901 "Standard for Fire Apparatus".

If the fire pump has a rated capacity of 750 gpm (3000 L/min) or greater, the pump shall be tested after the pump and all its associated piping and equipment have been installed on the apparatus.

A three (3) hour pumping test from draft shall be completed and certified to perform as listed below;

- 100% of rated capacity at 150 psi (1,000 kPa) net pressure, 2 hours
- 70% of rated capacity at 200 psi (1,400 kPa) net pressure, 1/2 hour
- 50% of rated capacity at 250 psi (1,700 kPa) net pressure, 1/2 hour

The test shall include at least the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and the vacuum test.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 psi (3,400 kPa).

The pump shall comply with the applicable requirements of "Standard for Fire Apparatus 1901, latest edition.

The pump shall be capable of producing fire streams that are free from objectionable pulsation under all normal operating conditions.

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If the apparatus is equipped with a pump driven by the chassis engine designed for both stationary pumping and pump-and-roll, the test shall verify that the engine speed control at the pump operator's panel cannot be advanced when either of the following conditions exists:

- (1) The chassis transmission is in neutral, the parking brake is off, and the pump shift status in the driving compartment is disengaged.
- (2) The chassis transmission is in any gear other than neutral, the parking brake is on, and the pump shift in the driving compartment is in the "Pump Engaged" or the "OK to Pump-and-Roll" position.

A test plate shall be provided at the pump operator's panel that gives the rated discharges and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump as used, and the governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve.

### **BID BOND AND/OR SECURITY**

Each bid must be accompanied by a bid bond in the amount of 5% of the maximum amount of the bid, or in lieu thereof, a deposit of cash or certified check payable to Campbell County Fire Department in an amount equal to 5% of the maximum amount of the bid, to assure the Campbell County Fire Department of the adherence of the Bidder to his bid and the execution of the contract, if their bid is accepted.

Within ten (10) days after the opening of bids, the deposits of all but the three (3) lowest responsible Bidders who comply with these specifications will be returned.

Within ten (10) days after the award of the contract, if an award is made, the deposits of the remaining two (2) unsuccessful Bidders will be returned, or if all bids are rejected, the deposits of said three (3) lowest Bidders will be returned.

Within ten (10) days after the execution of the contract and acceptance of the Bidder's bond by the Campbell County Fire Department, the deposit of the successful Bidder will be returned.

No plea of mistake in such accepted bid shall be available to the Bidder for the recovery of his deposit or as a defense to any action based upon such accepted bid.

### **WARRANTY**

A full statement shall be provided of the warranties for the vehicle(s) being bid. Warranties should clearly describe the terms under which the vehicle manufacturer accepts responsibility for the cost to repair defects caused by faulty design, quality of work or material and for the applicable period of time after delivery.

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

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

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## **GENERAL LIMITED WARRANTY - TWO (2) YEARS**

The vehicle shall be free of defects in material and workmanship for a period of two (2) years or 36,000 miles (or 57,936 kilometers), whichever occurs first starting thirty (30) days after the original invoice date.

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

## **LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS**

The vehicle low voltage electrical system shall be free of defects in material and workmanship for a period of five (5) years or 60,000 miles (or 96,561 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

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

The body shall be free of structural or design failure or workmanship for a period of ten (10) years, or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

## **UNDERCOAT WARRANTY**

The body undercoating shall have a warranty provided by the manufacturer for the lifetime of the vehicle or twenty (20) years, whichever occurs first. The warranty shall be transferable between vehicle owners. Should the undercoating material applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

## **PAINT LIMITED WARRANTY - TEN (10) YEARS**

The body shall be free of bubbling or peeling as a result of a defect in the method of manufacture for a period of ten (10) years or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date. **Pro-rated warranties will not be acceptable.**

## **GRAPHICS LIMITED WARRANTY**

The 3M graphics installation shall be warranted for a period of two (2) years. The 3M materials installed on completed vehicle shall be warranted for seven (7) years. The 3M Diamond grade film (if specified) shall be warranted for ten (10) years.

## **WATEROUS FIVE YEAR PUMP WARRANTY**

The fire pump shall be warranted by Waterous for a period of five (5) years from the date of delivery to the Campbell County Fire Department.

## **STAINLESS STEEL PLUMBING WARRANTY**

The stainless steel plumbing shall be free of defects in material and workmanship for a period of ten (10) years, or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

The contractor shall supply details of their warranty information with their bid submission.

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## **ELKHART BRASS FIVE YEAR VALVE WARRANTY**

The Elkhart Brass valves shall be warranted by Elkhart Brass for a period of ten (10) years from the date of delivery to the Campbell County Fire Department. This limited warranty does not cover the Unibody valve ball and seat (wear items). The warranty for electronics shall be warranted by Elkhartm Brass for a period of five (5) years from date of delivery to the Campbell County Fire Department.

## **UPF POLY WATER TANK WARRANTY**

The UPF poly water tank shall be provided with a lifetime material and workmanship limited warranty. The manufacturer shall supply details of their warranty information with their bid submission.

## **CONSTRUCTION PERIOD**

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

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

A penalty of \$250/day will be deducted from final invoice if delivered late. This delivery estimate is based on the SVI receiving complete and accurate information and paperwork from the Campbell County Fire Department and that no changes take place during pre-construction, mid-inspection, or final inspections. Any changes required or requested by the Campbell County Fire Department during the construction process may be cause for an increase in the number of days required.

## **OVERALL HEIGHT REQUIREMENT**

The overall height (OAH) of the vehicle shall be approximately 132" from the ground. This measurement shall be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

## **OVERALL LENGTH**

The overall length (OAL) of the vehicle shall be approximately 348".

## **ANGLE OF APPROACH**

The angle of approach for this vehicle shall not be less than eight (8) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1901.

## **ANGLE OF DEPARTURE**

The angle of departure for this vehicle shall not be less than eight (8) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1901.

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## **PRE-CONSTRUCTION CONFERENCE**

A pre-construction conference for four (4) department members shall be required at the Campbell County Fire Department location to finalize all construction details prior to manufacturing.

### **SHOP NOTE**

This is discounted for a 2- Truck PCM. Price divided by 2 Trucks.

## **PRE-PAINT CONFERENCE**

A pre-paint conference for four (4) department members shall be required at the Contractor's factory for four (4) personnel from the Campbell County Fire Department to inspect the vehicle and construction details prior to the painting process.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the pre-paint conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

## **FINAL INSPECTION CONFERENCE**

A final inspection conference for four (4) department members shall be required at the Contractor's factory for four (4) personnel from the Campbell County Fire Department to inspect the vehicle and construction details prior to shipment of the completed vehicle. This inspection shall take place after any specified striping and lettering is installed.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the final inspection conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

## **DELIVERY AND DEMONSTRATION**

The Contractor shall be responsible for the delivery of the completed unit to the Campbell County Fire Department's location. On initial delivery of the apparatus, the Contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the Campbell County Fire Department regarding the operation, care and maintenance of the apparatus and equipment supplied at Campbell County Fire Department location.

The Delivery Engineer shall set delivery and instruction schedule with the person appointed by Campbell County Fire Department.

After delivery of the apparatus, the Campbell County Fire Department shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment.

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## CAB/CHASSIS SPECIFICATIONS

### VEHICLE CONFIGURATION

108SD CONVENTIONAL CHASSIS

2020 MODEL YEAR SPECIFIED

SET BACK AXLE - TRUCK

### GENERAL SERVICE

FIRE/EMERGENCY SERVICE

FREIGHTLINER SD VOCATIONAL WARRANTY

EXPECTED FRONT AXLE LOAD: 16000 lbs.

EXPECTED REAR DRIVE AXLE LOAD: 24000 lbs.

EXPECTED GROSS VEHICLE CAPACITY: 40000 lbs.

### ENGINE

CUM L9 400EV HP @ 2100 RPM; 2200 GOV RPM, 1250 LB/FT @ 1400 RPM, FIRE/EMERGENCY

### ELECTRONIC PARAMETERS

CRUISE CONTROL SPEED LIMIT SAME AS ROAD SPEED LIMIT

PTO MODE BRAKE OVERRIDE - SERVICE BRAKE APPLIED

PTO RPM WITH CRUISE SET SWITCH

PTO RPM WITH CRUISE RESUME SWITCH

PTO MODE CANCEL VEHICLE SPEED

PTO GOVERNOR RAMP RATE

ONE REMOTE PTO SPEED

PTO SPEED 1 SETTING

PTO MINIMUM RPM

REGEN INHIBIT SPEED THRESHOLD - 5 MPH

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## ENGINE EQUIPMENT

2016 ONBOARD DIAGNOSTICS/2010 EPA/CARB/FINAL GHG17 CONFIGURATION

2008 CARB EMISSION CERTIFICATION - EXEMPTED VEHICLE; NO CLEAN IDLE LABEL REQUIRED

STANDARD OIL PAN

ENGINE MOUNTED OIL CHECK AND FILL

NFPA COMPLIANT EMBER SCREEN AND FIRE-RETARDANT DONALDSON AIR CLEANER

DR 12V 275 AMP 40-SI BRUSHLESS PAD ALTERNATOR WITH REMOTE BATTERY VOLTAGE SENSE

(3) ALLIANCE MODEL 1231XOE, GROUP 31, 12 VOLT MAINTENANCE FREE 3375 CCA THREADED STUD BATTERIES WITH POSITIVE JUMP START POST

BATTERY BOX FRAME MOUNTED

STANDARD BATTERY JUMPERS

SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB

WIRE GROUND RETURN FOR BATTERY CABLES WITH ADDITIONAL FRAME GROUND RETURN

NON-POLISHED BATTERY BOX COVER

NO CAB AUXILIARY POWER WIRING

POSITIVE LOAD DISCONNECT WITH CAB MOUNTED CONTROL SWITCH MOUNTED OUTBOARD DRIVER SEAT

CUMMINS TURBOCHARGED 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE

CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH

RH MOUNTED HORIZONTAL AFTERTREATMENT SYSTEM ASSEMBLY WITH RH HORIZONTAL TAILPIPE

STANDARD EXHAUST SYSTEM LENGTH

100 PERCENT DIESEL EXHAUST FLUID FILL

STANDARD DIESEL EXHAUST FLUID TANK CAP

HORTON DRIVEMASTER ADVANTAGE ON/OFF FAN DRIVE

AUTOMATIC FAN CONTROL WITH DASH SWITCH

CUMMINS SPIN ON FUEL FILTER

COMBINATION FULL FLOW/BYPASS OIL FILTER

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

1115 SQUARE INCH ALUMINUM RADIATOR WITH AUXILIARY ENGINE COOLING

ANTIFREEZE TO -34F, OAT (NITRITE AND SILICATE FREE) EXTENDED LIFE COOLANT

GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT

CONSTANT TENSION HOSE CLAMPS FOR COOLANT HOSES

ELECTRIC GRID AIR INTAKE WARMER

DELCO 12V 38MT HD STARTER WITH INTEGRATED MAGNETIC SWITCH

JUMP START POSTS ON FRAME

ENGINE BLOCK HEATER

OIL PAN HEATER

## TRANSMISSION

ALLISON 3000 EVS AUTOMATIC TRANSMISSION WITH PTO PROVISIONS

## TRANSMISSION EQUIPMENT

ALLISON VOCATIONAL RATING FOR FIRE TRUCK/EMERGENCY VEHICLE APPLICATIONS  
AVAILABLE WITH ALL PRODUCT FAMILIES

PRIMARY MODE GEARS, LOWEST GEAR 1, START GEAR 1, HIGHEST GEAR 6, AVAILABLE FOR  
3000/4000 PRODUCT FAMILIES ONLY

SECONDARY MODE GEARS, LOWEST GEAR 1, START GEAR 1, HIGHEST GEAR 6, AVAILABLE FOR 3000/4000  
PRODUCT FAMILIES ONLY

PRIMARY SHIFT SCHEDULE RECOMMENDED BY DTNA AND ALLISON, THIS DEFINED BY ENGINE  
AND VOCATIONAL USAGE

SECONDARY SHIFT SCHEDULE RECOMMENDED BY DTNA AND ALLISON, THIS DEFINED BY  
ENGINE AND VOCATIONAL USAGE

PRIMARY SHIFT SPEED RECOMMENDED BY DTNA AND ALLISON, THIS DEFINED BY ENGINE AND  
VOCATIONAL USAGE

SECONDARY SHIFT SPEED RECOMMENDED BY DTNA AND ALLISON, THIS DEFINED BY ENGINE  
AND VOCATIONAL USAGE

LOAD BASED SHIFT SCHEDULE AND VEHICLE ACCELERATION CONTROL RECOMMENDED BY  
DTNA AND ALLISON, THIS DEFINED VOCATIONAL USAGE

NEUTRAL AT STOP - DISABLED, FUELSENSE - DISABLED

DRIVER SWITCH INPUT - DEFAULT - NO SWITCHES

CUSTOMER INSTALLED CHELSEA 277 SERIES PTO



# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

PTO MOUNTING, LH SIDE OF MAIN TRANSMISSION

MAGNETIC PLUGS, ENGINE DRAIN, TRANSMISSION DRAIN, AXLE(S) FILL AND DRAIN

PUSH BUTTON ELECTRONIC SHIFT CONTROL, DASH MOUNTED

TRANSMISSION PROGNOSTICS - ENABLED 2013

WATER TO OIL TRANSMISSION COOLER, IN RADIATOR END TANK

MERITOR MTC-4210 TRANSFER CASE & OIL COOLER

TRANSMISSION OIL CHECK AND FILL WITH ELECTRONIC OIL LEVEL CHECK

TRANSFER CASE SHIFT CONTROLS WITH TRANSFER CASE PTO ON/OFF SWITCH WHEN APPLICABLE

SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

## FRONT AXLE AND EQUIPMENT

MX-16-120 16,000# 1790MM KPI SINGLE FRONT DRIVE AXLE

4.88 FRONT AXLE RATIO

MXL 16T MERITOR EXTENDED LUBE FRONT STEERING AXLE DRIVELINE WITH HALF ROUND YOKES

MERITOR 16.5X6 Q+ MX DRIVE AXLE CAST SPIDER CAM FRONT BRAKES

FIRE AND EMERGENCY SEVERE SERVICE, NON-ASBESTOS FRONT LINING

MERITOR CAST IRON FRONT BRAKE DRUMS

FRONT BRAKE DUST SHIELDS

FRONT GREASE SEAL

STANDARD SPINDLE NUTS FOR ALL AXLES

MERITOR AUTOMATIC FRONT SLACK ADJUSTERS

STANDARD KING PIN BUSHINGS

TRW TAS-85 POWER STEERING

POWER STEERING PUMP

2 QUART SEE THROUGH POWER STEERING RESERVOIR

SYNTHETIC 75W-90 FRONT AXLE LUBE

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## FRONT SUSPENSION

16,000# TAPERLEAF FRONT SUSPENSION

MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION

FRONT SUSPENSION WITH LEFT HAND OFFSET SHACKLE BRACKET

FRONT SHOCK ABSORBERS

## REAR AXLE AND EQUIPMENT

24,000 LB FIRE/EMERGENCY SERVICE SINGLE REAR AXLE

4.89 REAR AXLE RATIO

IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING

MXL 17T MERITOR EXTENDED LUBE MAIN DRIVELINE WITH HALF ROUND YOKES

MXL 17T MERITOR EXTENDED LUBE INTERTRANSMISSION DRIVELINE WITH HALF ROUND YOKES

DRIVER CONTROLLED TRACTION DIFFERENTIAL

(1) DRIVER CONTROLLED DIFFERENTIAL LOCK REAR VALVE FOR SINGLE DRIVE AXLE

MERITOR 16.5X7 Q+ CAST SPIDER HEAVY DUTY CAM REAR BRAKES, DOUBLE ANCHOR, FABRICATED SHOES

FIRE AND EMERGENCY SEVERE SERVICE NON-ASBESTOS REAR BRAKE LINING

BRAKE CAMS AND CHAMBERS ON REAR SIDE OF DRIVE AXLE(S)

CONMET CAST IRON REAR BRAKE DRUMS

REAR BRAKE DUST SHIELDS

REAR OIL SEALS

BENDIX EVERSURE LONGSTROKE 1-DRIVE AXLE SPRING PARKING CHAMBERS

MERITOR AUTOMATIC REAR SLACK ADJUSTERS

SYNTHETIC 75W-90 REAR AXLE LUBE

STANDARD REAR AXLE BREATHER(S)

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## REAR SUSPENSION

24,000# FLAT LEAF SPRING REAR SUSPENSION WITH HELPER, WITH RADIUS ROD, FOR FIRE/EMERGENCY SERVICE

SPRING SUSPENSION - NO AXLE SPACERS

STANDARD AXLE SEATS IN AXLE CLAMP GROUP

FORE/AFT CONTROL RODS

## BRAKE SYSTEM

WABCO 4S/4M ABS WITH TRACTION CONTROL & ESC

REINFORCED NYLON, FABRIC BRAID AND WIRE BRAID CHASSIS AIR LINES

FIBER BRAID PARKING BRAKE HOSE

STANDARD BRAKE SYSTEM VALVES

STANDARD AIR SYSTEM PRESSURE PROTECTION

STD U.S. FRONT BRAKE VALVE

RELAY VALVE WITH 5-8 PSI CRACK PRESSURE, NO REAR PROPORTIONING VALVE

BW AD-9SI BRAKE LINE AIR DRYER WITH HEATER

AIR DRYER FRAME MOUNTED

CUSTOM STEEL AIR BRAKE RESERVOIRS

BW DV-2 AUTO DRAIN VALVE WITH HEATER - WET TANK

## TRAILER CONNECTIONS

UPGRADED CHASSIS MULTIPLEXING UNIT

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## WHEELBASE AND FRAME

5000MM (197 INCH) WHEELBASE

11/32X3-1/2X10-15/16 INCH STEEL FRAME (8.73MMX277.8MM/0.344X10.94 INCH) 120KSI

(80 INCH) REAR FRAME OVERHANG

FRAME OVERHANG RANGE: 71 INCH TO 80 INCH

CALC'D BACK OF CAB TO REAR SUSP C/L (CA): 84.2 in

SQUARE END OF FRAME

FRONT CLOSING CROSSMEMBER

LIGHTWEIGHT HEAVY-DUTY ALUMINUM ENGINE CROSSMEMBER

STANDARD MIDSHIP #1 CROSSMEMBER(S)

STANDARD REARMOST CROSSMEMBER

STANDARD SUSPENSION CROSSMEMBER

## CHASSIS EQUIPMENT

OMIT FRONT BUMPER, CUSTOMER INSTALLED SPECIAL BUMPER

24 INCH INTEGRAL FRONT FRAME EXTENSION

GRADE 8 THREADED HEX HEADED FRAME FASTENERS

TANK BODY 0 TO 1500 GALLONS

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## FUEL TANKS

50 GALLON RECTANGULAR ALUMINUM FUEL TANK - LH

6 GALLON DIESEL EXHAUST FLUID TANK

RECTANGULAR FUEL TANK

PLAIN ALUMINUM/PAINTED STEEL FUEL/HYDRAULIC TANK(S) WITH PAINTED BANDS

FUEL TANK(S) FORWARD

PLAIN STEP FINISH

DAVCO 245 FUEL/WATER SEPARATOR WITH WATER IN FUEL SENSOR AND 12 VOLT PREHEATER

EQUIFLO INBOARD FUEL SYSTEM

NO NATURAL GAS VEHICLE FUEL TANK VENT LINE/STACK

HIGH TEMPERATURE REINFORCED NYLON FUEL LINE

## TIRES

MICHELIN XDN2 GRIP 315/80R22.5 20 PLY RADIAL FRONT TIRES

MICHELIN XDN2 GRIP 315/80R22.5 20 PLY RADIAL REAR TIRES

## HUBS

MERITOR IRON FRONT HUBS

CONMET PRESET PLUS PREMIUM IRON REAR HUBS

## WHEELS

ALCOA ULTRA ONE 89U64X 22.5X9.00 10-HUB PILOT 5.99 INSET ALUMINUM FRONT WHEELS

ALCOA ULTRA ONE 89U64X 22.5X9.00 10-HUB PILOT 5.99 INSET ALUMINUM REAR WHEELS

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## CAB EXTERIOR

156 INCH BBC HIGH-ROOF ALUMINUM CONVENTIONAL AIR RIDE CREW CAB WITH COMPOSITE SUN VISOR

AIR CAB MOUNTING

NONREMOVABLE BUGSCREEN MOUNTED BEHIND GRILLE

FRONT FENDERS SET-BACK AXLE

BOLT-ON MOLDED FLEXIBLE FENDER EXTENSIONS

NFPA COMPLIANT EXTERIOR GRAB HANDLES

BRIGHT FINISH RADIATOR SHELL/HOOD BEZEL

STATIONARY BLACK GRILLE WITH BRIGHT ACCENTS

CHROME HOOD MOUNTED AIR INTAKE GRILLE

FIBERGLASS HOOD

FIREWALL INSULATION

VALVE AND PLUMBING FOR CUSTOMER FURNISHED AIR HORN WITH STEERING WHEEL & RH FOOT SWITCH ACTIVATION

DUAL ELECTRIC HORNS

DUAL HORN SHIELDS

REAR LICENSE PLATE MOUNT END OF FRAME

HALOGEN COMPOSITE HEADLAMPS WITH BRIGHT BEZELS & DAYTIME RUNNING LIGHTS

LED AERODYNAMIC MARKER LIGHTS

STANDARD FRONT TURN SIGNAL LAMPS

DUAL WEST COAST BRIGHT FINISH HEATED MIRRORS WITH LH AND RH REMOTE

DOOR MOUNTED MIRRORS

102 INCH EQUIPMENT WIDTH

LH AND RH 8 INCH BRIGHT FINISH CONVEX MIRRORS MOUNTED UNDER PRIMARY MIRRORS

STANDARD SIDE/REAR REFLECTORS

OMIT REAR WINDOW

TINTED DOOR GLASS LH AND RH WITH TINTED NON-OPERATING WING WINDOWS

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

RH AND LH ELECTRIC POWERED WINDOWS

LH AND RH ELECTRIC DOOR LOCKS

TINTED WINDSHIELD

8 LITER WINDSHIELD WASHER RESERVOIR, CAB MOUNTED, WITH FLUID LEVEL INDICATOR

## CAB INTERIOR

OPAL GRAY VINYL INTERIOR

MOLDED PLASTIC DOOR PANEL WITH ALUMINUM KICKPLATES LOWER DOORS

BLACK MATS WITH PREMIUM INSULATION

NO DASH MOUNTED ASH TRAYS AND LIGHTER

FORWARD ROOF MOUNTED CONSOLE WITH UPPER STORAGE COMPARTMENTS WITHOUT NETTING

IN DASH STORAGE BIN

(2) CUP HOLDERS LH AND RH DASH

GRAY/CHARCOAL FLAT DASH

WOODGRAIN INSTRUMENT PANELS

SMART SWITCH EXPANSION MODULE

HEATER, DEFROSTER AND AIR CONDITIONER

AUXILIARY HEATER/AIR CONDITIONER WITH CONSTANT OUTLET TEMPERATURE CONTROL

STANDARD HVAC DUCTING

MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH

STANDARD HEATER PLUMBING

DENSO HEAVY DUTY AIR CONDITIONER COMPRESSOR

BINARY CONTROL, R-134A

SOLID-STATE CIRCUIT PROTECTION AND FUSES

12V NEGATIVE GROUND ELECTRICAL SYSTEM

OVERHEAD INSTRUMENT PANEL

DOOR ACTIVATED DOME/RED MAP LIGHTS, FORWARD LH AND RH AND REAR LH, RH AND CENTER

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

(1) 12V POWER SUPPLY & (2) USB CHARGERS IN DASH

SEATS INC 911 UNIVERSAL SERIES HIGH BACK AIR SUSPENSION DRIVER SEAT NFPA COMPLIANT SEAT SENSOR

SEATS INC 911 UNIVERSAL SERIES HIGH BACK, NON SCBA, NON SUSPENSION, PASSENGER SEAT NFPA COMPLIANT SEAT SENSOR

SEATS INC 911 UNIVERSAL SCBA NON-SUSPENSION LH AND RH REAR PASSENGER SEATS WITH UNDER SEAT STORAGE NFPA COMPLIANT SEAT SENSOR

LH AND RH INTEGRAL DOOR PANEL ARMRESTS

GRAY VINYL DRIVER SEAT COVER WITH GRAY CORDURA CLOTH BOLSTER AND HEADREST

GRAY VINYL FRONT PASSENGER SEAT COVER WITH GRAY CORDURA CLOTH BOLSTER AND HEADREST

GRAY VINYL REAR PASSENGER SEAT COVER WITH GRAY CORDURA CLOTH BOLSTER AND HEADREST

NFPA 1901-2009 HIGH VISIBILITY ORANGE SEAT BELTS

ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN

4-SPOKE 18 INCH (450MM) STEERING WHEEL

DRIVER AND PASSENGER INTERIOR SUN VISORS

DOOR MAP POCKET

## INSTRUMENTS AND CONTROLS

BLACK GAUGE BEZELS

LOW AIR PRESSURE INDICATOR LIGHT AND AUDIBLE ALARM

2 INCH PRIMARY AND SECONDARY AIR PRESSURE GAUGES

ENGINE COMPARTMENT MOUNTED AIR RESTRICTION INDICATOR WITH GRADUATIONS

ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL

ICU3S, 132X48 DISPLAY WITH DIAGNOSTICS, 28 LED WARNING LAMPS AND DATA LINKED

FIRE AND EMERGENCY SERVICE VEHICLES ENGINE WARNING

HEAVY DUTY ONBOARD DIAGNOSTICS INTERFACE CONNECTOR LOCATED BELOW LH DASH

2 INCH ELECTRIC FUEL GAUGE

ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE

2 INCH TRANSMISSION OIL TEMPERATURE GAUGE



# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY

HOBBS HOUR METER

CUSTOMER FURNISHED AND INSTALLED PTO CONTROLS

ELECTRIC ENGINE OIL PRESSURE GAUGE

AM/FM/WB WORLD TUNER RADIO WITH AUXILIARY INPUT, J1939

DASH MOUNTED RADIO

(2) RADIO SPEAKERS IN CAB

AM/FM ANTENNA MOUNTED ON FORWARD LH ROOF

ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE

STANDARD VEHICLE SPEED SENSOR

ELECTRONIC 3000 RPM TACHOMETER

IGNITION SWITCH CONTROLLED ENGINE STOP

DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY

SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY

MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH

ONE VALVE PARKING BRAKE SYSTEM WITH DASH VALVE

SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE

INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS

## DESIGN

PAINT: TWO-TONE

## COLOR

**CAB COLOR A - TOP: DARK SHADOW GRAY METALLIC ELITE BC**

**CAB COLOR B - BOTTOM: RED PIERCE #90 ELITE BC**

BLACK, HIGH SOLIDS POLYURETHANE CHASSIS PAINT

STANDARD E COAT/UNDERCOATING

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **CAB TO AXLE DIMENSION**

Cab to axle will be 84".

## **CHASSIS MODIFICATIONS**

## **LUBRICATION AND TIRE DATA PLATE**

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

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

## **VEHICLE DATA PLATE**

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

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

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **OVERALL HEIGHT, LENGTH DATA PLATE (US)**

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

The label shall show the height of the completed fire apparatus in feet and inches, the length of the completed fire apparatus in feet and inches, and the GVWR in pounds.

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

## **PERSONNEL CAPACITY**

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

## **SEAT BELT WARNING - FAMA06/07**

A safety sign FAMA06 shall be visible from each seat that is not equipped with occupant restraint and therefore not intended to be occupied while the vehicle is in motion.

A safety sign FAMA07, which warns of the importance of seat belt use, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

## **EQUIPMENT MOUNTING FAMA10**

A safety sign FAMA10, which warns of the need to secure items in the cab, shall be visible inside the cab.

## **FIRE SERVICE TIRES - FAMA12**

A safety sign FAMA12, which warns of the special requirements for fire service-rated tires, shall be visible to the driver entering the cab of any apparatus so equipped.

## **HELMET WARNING - FAMA15**

A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

## **CLIMBING METHOD - FAMA23**

A safety sign FAMA23, which warns of the proper climbing method, shall be visible to personnel entering the cab and at each designated climbing location on the body.

## **REAR STEP CROSSWALK WARNING - FAMA24**

A safety sign FAMA24, which warns personnel not to ride on the vehicle, shall be located at the rear step areas and at any cross walkways.

## **FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION**

A final stage manufacturer vehicle certification label shall be provided and installed in the driver cab door jamb area.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **FRONT BUMPER**

The cab/chassis supplied bumper shall be removed and replaced with a 12" high formed 10 gauge stainless steel swept-back style bumper. The bumper shall come with openings for front bumper discharge(s), if specified and painted lower cab color choice.

## **FRONT BUMPER EXTENSION**

The front bumper of the chassis shall be extended approximately 22" ahead of the cab using structural steel channel.

The bumper mounting plate shall be welded to the structural steel channel for mounting of the chassis bumper. After fabrication of the bumper extension, the panels shall be removed and the unit shall be primed and painted black.

## **BUMPER GRAVEL SHIELD**

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

## **BUMPER PRE-CONNECT COMPARTMENT**

The bumper extension shall have one (1) fire hose pre-connect compartment full width of bumper extension, capable of holding up to 250' of 1-3/4" double jacket hose and nozzle. The compartments shall be as large as room allows. Compartment doors shall be 1/8" NFPA compliant aluminum tread plate with stainless steel hinge wrapped with vinyl and chrome push release type latches. Doors shall be notched to allow fire hose to be pre-connected to swivel located on front bumper. The compartment doors shall have a gas shock type hold open device. Compartments shall not be watertight but shall include a compartment drain.

A safety sign FAMA22, which warns of the need to secure hose, shall be visible to personnel at each hose storage area.

If the bumper compartment is greater than 4 cu.ft. in volume and has an opening greater than 144 sq.in. it shall have sufficient compartment lighting to provide a minimum of 2 fc (20 lx) at any location on the floor of the compartment without any equipment in the compartment. If light is required, there shall be one (1) OnScene Access LED light mounted to light inside the compartment area.

A flashing warning light signal shall be provided indicating when a compartment door is not in a closed position as required by NFPA 1901.

## **AIR HORNS**

Two (2) Grover 24" Stuttertone chrome plated air horns shall be recess mounted in the front bumper, one (1) on each side outboard of the frame rails. An emergency air shut off valve shall be provided in the cab.

## **AIR HORN ACTIVATION**

The air horn(s) shall be operated by a foot switch on the cab floor located at both the driver and officer positions.

## **GROUND LIGHTS**

There shall be two (2) OnScene 8" Access LED lights installed below bumper capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting shall be switchable but activated automatically when the vehicle park brake is set.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **FRONT TOW PROVISIONS**

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

## **AIR INTAKE SYSTEM**

An air filter shall be provided in the engine's air intake system by the commercial cab/chassis manufacturer. Air inlet restrictions shall not exceed the engine manufacturer's recommendations. The air inlet shall be equipped with a means of separating water and burning embers from the air intake system.

In addition to the engine's air intake, the cab fresh air intake and/or outside cab vent shall be equipped with a means of separating water and burning embers from the air intake system

This requirement shall be permitted to be achieved by either of the following methods:

1. Provision of a device such that burning particulate matter larger than 0.039 in. (1.0 mm) in diameter cannot reach the air filter element.
2. Provision of a multi screen ember separator capable of meeting the test requirements defined in the Parker Hannafin, Racor Division, publication LF 1093-90, *Ember Separation Test Procedure*, or an equivalent test.

## **EXHAUST**

The existing exhaust tailpipe shall be extended to ahead of the rear axle on the curbside.

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

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

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

## **PLYMOVENT EXHAUST ADAPTER**

A Plymovent 5" exhaust adapter flange for a Plymovent magnetic systems shall be provided and installed on the chassis engine exhaust tailpipe.

## **BATTERY JUMPER STUDS**

Two (2) battery jumper studs, one (1) positive with a red weather cover, and one (1) negative with a black weather cover shall be provided in the lower front portion of the driver step area. Jumper studs shall be identified with color coded label.

These studs shall allow this vehicle to be jump started due to a battery failure, or to allow easy access to assist another vehicle.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **RADIO/ANTENNA INSTALLATION**

There shall be one (1) Campbell County Fire Department supplied radio(s) with antenna installed in the cab within easy reach of driver. The location of radio shall be determined by the Campbell County Fire Department at the pre-construction meeting. All required radio programming shall be responsibility of Campbell County Fire Department. Radio(s) may not be fully tested if no radio program is provided with radio and will be responsibility of Campbell County Fire Department after delivery.

Radio shall be installed per Manufacturer's requirements and wired for proper 12 volt power and ground.

## **RADIO CHARGERS / ANTENNA**

One (1) Motorola brand portable radio charger installed at the location identified by the Campbell County Fire Department at the pre-construction conference. It shall accommodate a Motorola APX 7000. Motorola part number NNTN7624B.

One (1) Motorola brand portable radio charger installed at the location identified by the Campbell County Fire Department at the pre-construction conference. It shall accommodate a Motorola XTS2500. Motorola part number WPLN4208C.

One (1) Wilson Electronics cell phone booster. Model 470108 shall be installed at the location identified by the Campbell County Fire Department at the pre-construction conference.

## **THERMAL IMAGING CAMERA**

One (1) FLIR model K2 handheld Thermal Imaging Camera with in-truck charger model T199414ACC shall be installed in cab. Mounting location to be determined at pre-construction meeting.

## **12 VDC FUSE BLOCK**

There shall be one (1) Blue Sea Systems 100 amp ST Series blade type fuse block with screw type terminals for both positive and negative buss with cover provided for distribution of up to six (6) 30 amp, 12 VDC circuits. Fuse block shall be located per required circuits and be protected from damage.

## **SEAT SCBA BRACKETS**

There shall be four (4) IMMI SmartDock hands-free SCBA air pack bracket(s) that meet NFPA 1901 standards mounted in specified SCBA seats. No straps or levers are required. In a collision the top claws clamp-down preventing the SCBA from becoming a projectile. Three (3) SCBA brackets to be located in seat backs, and one (1) bracket to be located on the center console between the rear seats rear wall.

## **SEAT BELT COLOR**

Section 14.1.3.4 of the NFPA 1901 Standards, requires all seat belt webbing in cab to be bright red or bright orange in color, and the buckle portion of the seat belt shall be mounted on a rigid or semi rigid stalk such that the buckle remains positioned in an accessible location.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **SEAT BELT WEB LENGTH - COMMERCIAL CAB**

Sections 14.1.3.2 and 14.1.3.3 of the NFPA 1901 standards, require the effective seat belt web length for a Type 1 lap belt for pelvic restraint to be a minimum of 60", and a Type 2 pelvic and upper torso restraint-style seat belt assembly to be a minimum of 110".

The chassis seat belt web length as supplied by the commercial chassis manufacturer shall be compliant to NFPA Standards 14.1.3.2 and 14.1.3.3.

## **SEAT BELT MONITORING AND VEHICLE DATA RECORDER (VDR) SYSTEMS**

### **SEAT BELT MONITORING**

A Weldon 6204 series system with Occupant Restraint Indicator (ORI) display shall be provided and installed to allow the driver to know if all persons seated in the vehicle are secured with seat belts before moving the vehicle. Built-in smart seating logic shall detect if the correct sit and buckle sequence is not followed for all seats. System shall also provide an output for an external alarm. Weldon diagnostic port will be located under dash on driver side. System shall include the following features;

### **VEHICLE DATA RECORDER (VDR)**

The vehicle data recorder shall have the following features;

- Recorded Data Includes: Vehicle Speed, Acceleration, Deceleration, Engine Speed, Engine Throttle Position, ABS Event, Seat Occupied Status, Seat Belt Status, Master Optical Warning Switch, Park Brake, Service Brake, Time, Date and Engine Hours.
- Password Protected by the customer
- Six (6) seat position inputs for occupied and belts buckled. Additional six (6) seat expansion module available.
- Easily interfaces with traditional wiring, or optional V-MUX™ or other multiplexing systems
- Data is extracted by a standard, mini USB cable
- Use in conjunction with the Occupant Restraint Indicator or optional V-MUX™ multiplex system

### **OCCUPANT RESTRAINT INDICATOR**

The occupant restraint indicator shall have the following features;

- Supports commercial and custom cab seating layouts; up to 12 seats
- Built-in audible alarm
- Use in conjunction with Vehicle Data Recorder (VDR)

### **IGNITION KEY**

If the vehicle is specified to have an ignition key it will be attached to steering column or dash with vinyl covered steel cable.

### **SIX (6) – LED TIRE PRESSURE VISUAL INDICATORS**

Each tire valve stem shall be equipped with an LED Tire Alert (or equal), heavy duty valve cap LED indicator that indicates proper tire pressure. The LED Tire Alert valve cap is self-calibrating. When the cap is mounted on the valve stem the first time, it will memorize that tire pressure, and can be set to recognize a drop in pressure as little as 6 psi. It can be checked for functionality and battery condition by simply unscrewing the cap. If it is in working condition, it will immediately start blinking.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **HELMET STORAGE, DRIVING AREA**

One (1) OnScene Solutions Talon model helmet storage bracket(s) shall be provided and installed in the cab driving area. The helmet mounting will comply with the 9G NFPA requirements. If cab is specified with air bags, the helmet bracket(s) will be mounted clear of the deployment area.

- One (1) helmet bracket(s) shall be mounted overhead on the driver and officer sides of the raised roof slope of the cab.

## **HELMET STORAGE, CREW AREA**

Two (2) OnScene Solutions Talon model helmet storage bracket(s) shall be provided and installed in the rear crew area. The helmet mounting will comply with the 9G NFPA requirements. If cab is specified with air bags, the helmet bracket(s) will be mounted clear of the deployment area.

- Two (2) helmet bracket(s) shall be mounted on the rear wall area adjacent to seating. Mounting shall not interfere with air bag systems, if specified.

## **CAB CRASH TEST CERTIFICATION**

A cab crash test certification from the fire apparatus manufacturer shall be provided with the equipment. A copy of this certification shall be included with the bid.

NOTE: There shall be no exception to any portion of the cab integrity certification requirements. Nonconformance shall lead to immediate rejection of bid.

The certification shall state that the cab does meet or exceed the requirements below:

- 1) European Occupant Protection Standard ECE Regulation No. 29.
- 2) SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.

## **CAB MIRRORS, DRIVER ADJUSTABLE**

Section 14.3.5 of the NFPA 1901 Standards, 2009 edition, requires all primary rear view mirrors used by the driver to be adjustable from the driver's position.

## **CAB STEP COVERS AND HOSE REEL COMPARTMENTS**

The stock cab upper and lower entry steps shall be overlaid with 1/8" NFPA compliant aluminum treadplate.

The maximum stepping height shall not exceed 18", with the exception of the ground to first step, which shall not exceed 24" when the vehicle is loaded to its estimated in-service weight. All steps shall have a minimum area of 35 sq in and shall be of such a shape that a 5" diameter disk does not overlap any side when placed on the step, and shall be arranged to provide a t least 8" of clearance between the leading edge of the step and any obstruction. All platforms shall have a minimum depth of 8" from the leading edge of the platform to any obstruction.

There shall be aluminum compartments mounted beneath the crew doors on curbside of cab. The compartment shall be large enough to hold specified booster hose reel.

No door is provided over booster hose reel location. 4-way hose rollers are provided to prevent damage to booster hose. Booster hose valve control will be located on front vertical surface step cover.

The following options will be cut into the step cover:



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## **BATTERY CHARGING RECEPTACLE LOCATION**

The specified battery charging receptacle and/or display panel shall be located on front face of specified cab step cover.

## **MUDFLAPS**

There shall be 1/4" rubber mudflaps provided and installed behind each set of tires to prevent throwing road debris and lower road spray.

## **AIR BRAKE SYSTEM QUICK BUILD-UP**

There shall be one (1) Milton male quick connector type air shoreline inlet to provide air to the chassis air tanks from an external source compressed air shoreline hookup in order to maintain full operating air pressure while the vehicle is not running. Air inlet shall be located near driver's door. The female end of the connector shall be supplied by the Campbell County Fire Department.

The quick buildup system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the 60-second buildup time.

## **ROAD EMERGENCY SAFETY KIT**

The completed unit shall be supplied with one (1) set of three (3) dual faced reflective triangles, and three (3) warning flares complete with storage case per DOT requirements.

One (1) 2.5 lb. ABC type vehicle fire extinguisher with bracket per DOT requirements shall be provided and mounted inside cab area.

## **BODY DESIGN**

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

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

The sheet metal material requirements, including alloy and material thickness, throughout the specifications are considered to be a minimum. Since such materials are available to all Manufacturers, the material specifications shall be strictly adhered to.

The fabrication of the body shall be formed sheet metal. Formed components shall allow the Campbell County Fire Department to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the Campbell County Fire Department from such repair and shall NOT be used. All fabricated body components to be cut by a laser or water-jet for superior cut edge quality.

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

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## Type 3 Engine, SVI #1103-1104

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

### **EXTERIOR ALUMINUM BODY**

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

The body compartment floors and exterior panels shall be constructed with not less than 1/8" (.125) aluminum 3003H-14 smooth plate. Interior compartment dividing walls shall be constructed with not less than 1/8" (.125) aluminum 3003H-14 smooth plate. Lighter gauge sheet metal will not be acceptable in these areas, No Exceptions.

The front and rear corners of body shall be formed as part of the front or rear body panels. This provides a stronger body corner and finished appearance. The use of extruded corners, or caps will not be acceptable, No Exceptions.

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

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

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

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

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

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

### **DRIP RAILS**

The body shall have drip rails over the side full height compartments. The drip rails shall be formed into the upper body panels providing a ridged lower panel and a flat upper body panel surface. The use of mechanically fastened, taped or glued on drip rails will not be acceptable, No Exceptions.

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## **BODY SUBFRAME**

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

The body subframe shall be constructed from 6061T6 aluminum alloy tubing. Subframe shall consist of two (2) 2" x 4" x 1/4" aluminum tubes minimum, the same width as the chassis frame rails. Welded to this tubing shall be cross members of 2" x 4" x 1/4" aluminum. Smaller dimension, lighter gauge tubing or angle material subframe shall not be accepted.

These cross members shall extend the full width of the body to support the compartments. Cross members shall be located at front and rear of the body, below compartment divider walls, and in front and rear of wheel well opening. Additional aluminum cross members shall be located on 16" centers, or as necessary to support walkway or heavy equipment.

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

## **BODY MOUNTING**

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

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

## **12" REAR STEP BUMPER**

The full width rear bumper shall be constructed from 2" x 2" x 1/4" aluminum tubing frame and covered with 3/16" NFPA compliant aluminum tread plate. The bumper shall extend from the rear vertical body panel 12" and provide a rear step with a minimum of 1/2" space at body for water drainage.

## **REAR TOW EYES**

There shall be two (2) heavy duty rear mounted tow eyes securely attached to the body subframe, below body. The tow eyes shall be fabricated from 3/4" thick steel plate with a 3" diameter opening. Tow eyes shall have a black powder coat finish.

## **GROUND LIGHTS**

There shall be two (2) OnScene 8" Access LED lights installed below bumper capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting shall be switchable but activated automatically when the vehicle park brake is set.

## **WHEEL WELL EXTERIOR PANEL**

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

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## **RUBBER BODY FENDERS**

The body wheel well openings shall be provided with round radius, rubber fenderettes. The fenderettes shall be bolted and easily replaceable if damaged. The fenderettes shall be installed using stainless steel fasteners with plastic isolators to help prevent corrosion.

## **WHEEL WELL LINERS**

The wheel wells shall be provided with an easily removable 1/8" smooth aluminum, circular inner fender liner. The inner liner shall be bolted to the wheel well with stainless steel bolts and spaced away from the wheel well so the liner will not accumulate dirt or water.

## **ANGLED BODY PANEL BELOW SIDE REAR COMPARTMENTS**

No angled body panel shall be provided below the side rear compartments.

## **SCBA CYLINDER COMPARTMENTS**

There shall be four (4) SCBA cylinder storage compartments, two (2) on each side of body in the rear wheel well area. Each compartment shall have a stainless steel hinge with brushed stainless steel door assembly with a positive catch latch. Each compartment shall have a 8" diameter tube behind the wheel well panel attached to the door assembly. Each compartment shall allow the storage of an SCBA cylinder or a fire extinguisher up to 7-3/4" in diameter and 22" deep. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

## **BODY PAINT SPECIFICATIONS**

### **BODY PAINT PREPARATION**

After the body and components have been fabricated they shall be disassembled so when vehicle is complete there shall be finish paint beneath the removable components. The body shall be removed from chassis during the paint process to insure proper paint coverage. The body and components shall be metal finished as follows to provide a superior substrate for painting.

The exterior (and interior, if painted) body shall undergo a thorough cleaning process starting with a biodegradable phosphoric acid solution to begin the etching process followed by a complete clear water rinse. The next step shall consist of a chemical conversion coating applied to seal the metal substrate and become part of the metal surface for greater film adhesion.

All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be chrome plated. Iron fittings shall be copper under plated prior to chrome plating.

### **PAINT PROCESS**

The paint process shall follow the strict standards set forth by PPG Industries guidelines. Painters applying PPG products will be PPG Certified Commercial Technicians, and re-certified every two (2) years. The body shall go through the following paint process;

- 1) Clean bare metal with a wax and grease remover using low lint rags.
- 2) Inspect, straighten, and hammer high points, grind all seams, sharp edges, and welds. DA sand entire paintable surfaces using 24-180 grit dry paper. Plastic fill all low spots and DA sand fill areas using 36-180 grit dry paper. Apply pinhole filler and DA sand areas using 80-180 grit dry paper.
- 3) Re-clean bare metal using a wax and grease remover and low lint rags.

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- 4) Within 24 hours, a PPG Delfleet® epoxy color primer with proper hardener for corrosion resistance using a pressure pot spray gun and applying 2-5 full wet coats or 1.5-8.0 dry mils max. achieving full hiding and allow to air dry 60 minutes @ 70°F or bake for 45 minutes @ 140°F degree.
- 5) Inspect, putty fill, and dry guild coat entire body surface and DA sand using 180-400 grit dry paper.
- 6) Re-clean bare metal using a wax and grease remover using low lint rags.
- 7) A PPG Delfleet® primer sealer with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 1 full wet coat or 1.0-2.0 dry mils achieving full hiding and allow to flash off in spray booth for minimum of 60 minutes @ 70°F.
- 8) A PPG Delfleet® FBCH basecoat (color) with proper hardener and dry additive shall then be sprayed using a pressure pot set @ 45-60 PSI and achieving full hiding or 1.5-2.0 wet mils and allow to flash off in spray booth 45-60 minutes before applying clearcoat.
- 9) A PPG Delfleet® clearcoat with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 2-3 full wet coats or 5.0 wet mils for a uniform gloss and allow to flash off in spray booth 10 minutes and bake for 120-140 minutes @ 125°F (surface temp.).
- 10) After cooling, DA sand heavy orange peel or runs using 1000 grit dry sand paper and final DA sand using 1500-2000 grit dry sand paper. Wipe off all surfaces to remove dust and debris. Buff unit as needed using 3M rubbing compound and a white wool pad and inspect until all sand scratches are removed.
- 11) Polish as needed using 3M Perfect-It-Polish and a black foam pad, repeat as necessary and inspect until all sand scratches are removed.

### **PAINT - ENVIRONMENTAL IMPACT**

The contractor shall meet or exceed all current State (his) regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. PPG Delfleet® Evolution paint shall be free of all heavy metal (lead & chromate) components. Paint emissions from sanding and painting shall be filtered and collected. All paint wastes shall be disposed of in an environmentally safe manner. Solvents used in cleanup operations shall be collected, sent off-site for distillation and returned for reuse.

### **FASTENERS**

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

### **ELECTROLYSIS CORROSION CONTROL**

The vehicle shall be assembled using ECK brand or similar corrosion control compound on all high corrosion potential areas.

ECK protects aluminum and stainless steel against electrolytic reaction, isolates dissimilar metals and gives bedding protection for hardware and fasteners. ECK contains anti-seizing lubricant for threads. ECK is dielectric and perfect for use with electrical connectors.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **PAINT FINISH - TWO COLOR**

The body shall be painted with a two-tone single color of PPG Delfleet® Evolution per Campbell County Fire Department approved paint spray out provided.

A small touch-up bottle of paint shall be provided with completed vehicle.

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

Body paint break; drip rail up will be Metallic Gray PPG CX/M7039A.

## **BODY UNDERCOATING**

The entire underside of body shall be sprayed with black automotive undercoating. Undercoating shall cover all areas underside of body and wheel well area to help prevent corrosion under the vehicle.

## **UNDERCOAT WARRANTY**

The body undercoating shall have a warranty provided by the manufacturer for the lifetime of the vehicle or twenty (20) years, whichever occurs first. The warranty shall be transferable between vehicle owners. Should the undercoating material applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

## **PAINT WARRANTY**

The vehicle shall be provided with a ten (10) year non-prorated warranty to the original owner. Warranty is provided by PPG Inc. A warranty sheet with all conditions and maintenance procedures shall be provided with the delivered vehicle. **Pro-rated warranties will not be acceptable.**

## **COMPARTMENT INTERIOR FINISH**

The interior of all exterior body compartments shall be a "Maintenance Free" smooth unpainted finish. All body seams shall be finished with a caulk sealant for both appearance and moisture protection.

## **REFLECTIVE STRIPE REQUIREMENTS**

### **Material**

All retroreflective materials shall conform to the requirements of ASTM D4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

All retroreflective materials used that are colors not listed in ASTM D4956, Section 6.1.1, shall have a minimum coefficient of retro-reflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees.

Any printed or processed retroreflective film construction used shall conform to the standards required of an integral colored film as specified in ASTM D4956, Section 6.1.1.

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## Minimum Requirements

A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the vehicle, not including mirrors or other protrusions.

The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

A graphic design shall be permitted to replace all or part of the required striping material if the design or combination thereof covers at least the same perimeter length(s).

## **GRAPHICS PROOF**

A color graphics proof of the reflective striping layout shall be provided for approval by Campbell County Fire Department prior to installation. The graphics proof shall be submitted to Campbell County Fire Department on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details.

## **REFLECTIVE STRIPE - CAB SIDE**

The reflective stripe material shall be 4" wide, 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be black in color.

There shall be a 2" Scotchlite reflective stripe located approx. 1" above the main stripe.

- This reflective stripe shall be gold in color.

There shall be a 1" Scotchlite reflective stripe located approx. 1" below the main stripe.

- This reflective stripe shall be white in color.

## **REFLECTIVE STRIPE - CAB FRONT**

The reflective stripe material shall be 4" wide, 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be black in color.

## **CHEVRON STRIPE - CAB BUMPER**

A reflective stripe shall be affixed to the front of cab. The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

The approximate 10" wide Chevron retroreflective stripe shall be affixed to at least 25 percent of the width of the front of the apparatus with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width. Chevron panels shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panels shall have a minimum 10 year warranty for material failure, and colorfastness.

- The stripe material shall be 3M Scotchlite Diamond Grade.

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

This reflective chevron stripe shall alternate red and fluorescent yellow in color.

### **REFLECTIVE STRIPE - CAB DOOR INTERIOR**

Any door of the apparatus designed to allow persons to enter or exit the apparatus shall have at least 96 in.2 (62,000 mm2) of retroreflective material affixed to the inside of the door.

The stripe material shall be 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be black in color.

### **REFLECTIVE STRIPE - BODY SIDES**

The reflective stripe material shall be 4" wide, 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be black in color.

There shall be a 2" Scotchlite reflective stripe located approx. 1" above the main stripe.

- This reflective stripe shall be gold in color.

There shall be a 1" Scotchlite reflective stripe located approx. 1" above the main stripe.

- This reflective stripe shall be white in color.

The stripe shall extend straight from front of cab, then ahead of the rear wheels, it shall form an "S" shape and extend straight back to the rear of the body. The "S" portion of the stripe shall remain a solid color.

### **CHEVRON REFLECTIVE STRIPE - REAR CENTER/SIDE PANELS**

At least 50 percent of the rear-facing vertical surfaces, visible from the rear of the apparatus, excluding any pump panel areas not covered by a door, shall be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width.

The rear side panels and center of the body shall have a chevron style reflective stripe, extending from bumper height up to side compartment drip rail height. Chevron panels shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panels shall have a minimum 10 year warranty for material failure, and colorfastness.

The stripe material shall be 3M Diamond Grade.

This reflective chevron stripe shall alternate red and yellow in color.

### **CAB TWO-TONE STRIPE**

The cab shall have a 1/2" wide black stripe provided on each side of cab on the two-tone cab paint line.



# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **LETTERING**

### **GRAPHICS PROOF**

A color graphics proof of the lettering layout shall be provided for approval by Campbell County Fire Department prior to installation. The graphics proof shall be submitted to Campbell County Fire Department on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details.

The following lettering shall be provided and installed on the completed unit as follows;

### **SIDE CAB DOOR LETTERING**

There shall be twenty eight (28) 3" high reflective letters furnished and installed on the vehicle.

"CAMPBELL COUNTY"

- This reflective lettering shall be gold in color.

There shall be forty two (42) 4" high reflective letters furnished and installed on the vehicle.

"FIRE DEPARTMENT" - Front cab doors.

"ENGINE 12" - Rear cab doors.

- This reflective lettering shall be gold in color.

### **UPPER BODY SIDE LETTERING**

E-12 or E-13 Located on Lower side Roll-Up Doors

There shall be four (4) 10" high reflective letters furnished and installed on the vehicle.

"E1" - On lower side roll-up doors.

- This reflective lettering shall be white in color.

### **REAR BODY LETTERING**

"KEEP BACK 500 FEET"

There shall be fifteen (15) 6" high reflective letters furnished and installed on the vehicle.

- This reflective lettering shall be yellow in color.

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## **FRONT OF CAB LETTERING**

### **CAB ROOF LETTERING**

There shall be six (6) 22" high reflective letters furnished and installed on the vehicle.

- This reflective lettering shall be white in color.

There shall be NO lettering applied in this area.

### **CUSTOM DECAL LOGO - 12" -18"**

Two (2) custom designed 12" - 18" 3M Scotchlite type retroreflective logo shall be provided and located on the completed vehicle. The exact design and/or artwork shall be provided by the Campbell County Fire Department prior to construction.

Two (2) copy of the above custom logo shall be provided and located on the completed vehicle as directed by Campbell County Fire Department.

## **EXTERIOR COMPARTMENT DOORS**

### **FLUSH FITTING HINGED DOOR CONSTRUCTION**

The exterior compartment doors shall be a flush style, custom manufactured and built for each compartment. The compartment doors must be able to withstand years of rugged service and wear. For this reason, the compartment door design, metal thickness, and attachments must be strictly adhered to.

The compartment doors shall be all aluminum 3003H-14 alloy construction. The exterior panel shall be of 1/8" thickness smooth plate aluminum and the interior panel shall be of 1/8" thickness smooth plate aluminum. Lighter gauge material will NOT BE ACCEPTABLE in these areas. The double panel doors shall be 1-3/4" thick to completely enclose the door latching assembly. Doors shall have drain hole openings for drainage and ventilation.

The doors shall be flush mounted so that the outer surface is in line with the side body surface. Lap or bevel type constructed doors, doors framed with extrusions, or doors requiring rubber bumpers to prevent unnecessary contact are NOT ACCEPTABLE.

Compartment door openings shall be sealed with closed cell automotive type rubber molding to provide a weather resistant seal around door. In addition, rubber molding shall be provided along hinge to prevent moisture entry. Open cell foam type rubber moldings are NOT ACCEPTABLE.

Hinged compartment doors shall have 14 gauge stainless steel hinge, with 1/4" stainless steel pin. The hinge shall be bolted to the door and body with stainless steel machine screws. A polyester barrier film gasket shall be placed between stainless steel hinge and any dissimilar metals as necessary.

Drip rails shall be installed above all compartment door openings. Drip rails shall be completely removable for easy replacement if necessary.

Each door shall be capable of being opened or closed without unlatching. Door checks shall be bolted to the upper compartment door header and the box pan of the door. Door checks that require unlatching by hand will NOT BE ACCEPTABLE.

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Vertically hinged door openings up to 32" wide shall be single door construction. Door openings over 32" shall be double door construction with the forward first opening door overlapping the second opening door.

- The interior door panel shall have a smooth un-painted aluminum panel.

### **ROLL-UP DOOR CONSTRUCTION - ROBINSON (ROM)**

The vehicle shall be equipped with R•O•M Series IV roll-up exterior compartment doors. The R•O•M roll-up doors shall be complete with the following features;

Each shutter slat, track, bottom rail, and drip rail shall be constructed from anodized 6063 T6 aluminum. Shutter slats shall feature a double wall extrusion 0.315" thick with a concave interior surface to minimize loose equipment jamming the shutter door closed. Shutter slats shall feature an interlocking end shoe to prevent side to side binding of the shutter door during operation. Slat must have interlocking joints with an inverted locking flange. Slat inner seal shall be a one piece PVC extrusion; seal design will be such to prevent metal to metal contact while minimizing dirt and water from entering the compartment.

Shutter door track shall be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track shall feature an extruded Santoprene rubber double lip low profile side seal with a silicone co-extruded back to reduce friction during shutter operation.

Shutter bottom rail shall be a one piece double wall extrusion with integrated finger pull. Finger pull shall be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail shall have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal shall be made from Santoprene; it will be a double "V" seal to prevent water and debris from entering compartment. Bottom rail lift bar shall be a one piece "D" shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar shall have a wall thickness of 0.125". Lift bar shall be supported by no less than two pivot blocks; pivot blocks shall be constructed from Type 66 Glass filled reinforced nylon for superior strength. Bottom rail end blocks shall have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.

Shutter door shall have an enclosed counter balance system. Counter balance system shall be 4" in diameter and held in place by two (2) heavy duty 18 gauge zinc plated plates. Counter balance system shall have two (2) over-molded rubber guide wheels to provide a smooth transition from vertical track to counter balance system; no foam material of any kind shall be permitted or used in this area.

### **ROM DOOR BOTTOM RAIL**

All exterior compartment doors shall have the standard 3.0" tall bottom rail extrusion for easy one (1) hand opening and closing.

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

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **STREETSIDE COMPARTMENT - FRONT (S1)**

The interior useable compartment width shall be approximately 15.2" wide x 14" deep.

The compartment door opening shall be approximately 12.5" wide.

- This compartment shall have vertically hinged lap style compartment door with push release style latches. The door exterior shall be painted job color.
- The interior door panel shall have a smooth un-painted aluminum panel.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.
- The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the compartment door header and the box pan of the door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## **COMPARTMENT LAYOUT**

- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) OnScene Access LED, full height compartment light, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S2)**

The interior useable compartment width shall be approximately 54.0" wide.

The compartment door opening shall be approximately 49.5" wide.

This compartment shall have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## **COMPARTMENT LAYOUT**

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- Tool mounting board shall be provided on compartment back wall spaced away from compartment wall.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

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

The interior useable compartment width shall be approximately 47.0" wide.

The compartment door opening shall be approximately 42.0" wide.

This compartment shall have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## **COMPARTMENT LAYOUT**

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be two (2) adjustable shelf/shelves approximately 12" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
  - The above component(s) shall have a smooth un-painted finish.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **CURBSIDE COMPARTMENT - FRONT (C1)**

The interior useable compartment width shall be approximately 15.2" wide x 14" deep.

The compartment door opening shall be approximately 12.5" wide.

- This compartment shall have vertically hinged lap style compartment door with push release style latches. The door exterior shall be painted job color.
- The interior door panel shall have a smooth un-painted aluminum panel.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.
- The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the compartment door header and the box pan of the door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## **COMPARTMENT LAYOUT**

- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) OnScene Access LED, full height compartment light, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **CURBSIDE COMPARTMENT - ABOVE REAR WHEELS (C2)**

The interior useable compartment width shall be approximately 36.5" wide.

The compartment door opening shall be approximately 31.2" wide.

This compartment shall have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## **COMPARTMENT LAYOUT**

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) adjustable shelf/shelves approximately 12" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
  - The above component(s) shall have a smooth un-painted finish.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.



# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

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

The interior useable compartment width shall be approximately 47.0" wide.

The compartment door opening shall be approximately 42.0" wide.

This compartment shall have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- One (1) nylon strap shall be provided to assist in closing the door.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## **COMPARTMENT LAYOUT**

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be two (2) adjustable shelf/shelves approximately 12" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
  - The above component(s) shall have a smooth un-painted finish.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **REAR COMPARTMENT - CENTER (RC1)**

The rear center compartment shall start at the top of the body sub-frame and be as high as the side compartments, unless specified otherwise.

The interior useable compartment width shall be approximately 50.0" wide.

The compartment door opening shall be approximately 31.0" wide.

- This compartment shall have flush fitting vertically hinged compartment door. The door exterior shall be painted job color.
- The interior door panel shall have a smooth un-painted aluminum panel.
- The door shall be equipped with a Gas piston EZ switch mechanical type door ajar switch located inside compartment interior lower door track.
- The hinged door(s) shall have a stainless steel 6" offset bent D-ring non-locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.
- The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the compartment door header and the box pan of the door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## **COMPARTMENT LAYOUT**

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be two (2) adjustable shelf/shelves approximately 24" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.
  - The above component(s) shall have a smooth un-painted finish.
- There shall be two (2) aluminum handrail sections with brackets assembled under the hose bed extension step. Brackets shall be designed to hold the handrails in position with a quick pin to hold in place for operation. Inside the right rear ladder compartment door shall be a storage bracket to hold the handrails when not in use. The I-Zone brackets are provided to lace the hose between when moving from house to house during structure fire protection operations.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.

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## **PLASTIC FLOOR AND SHELF TILE**

All compartment floors, shelves, and trays shall be covered with Dri-Dek plastic interlocking grating.

- The plastic floor tile shall be red.
- The plastic edge trim shall be black.

## **LADDER LIFT SYSTEM, CURBSIDE**

A Ziamatic 12 VDC, 60 amp, HLAS (Horizontal Ladder Access System), model HLAS-975 shall be provided above the exterior side body compartments, on the curbside.

The lift system shall be electro-hydraulic with built-in electric safety latches and warning alarm when in operation. Access shall still be provided to compartments with system in lowered position. Flashing lights on ends shall produce a visual signal when the system is out of the stored position. A flashing warning light signal shall be provided indicating when a ladder rack is not in a stowed position as required by NFPA 1901. The outward ends of the equipment rack that protrude beyond the body of the apparatus shall have retroreflective material to indicate a hazard or an obstruction.

The ladder control panel shall be located on curbside pump panel. The ladder lift system shall be designed to store the specified ladders and equipment. The side of ladder storage area shall be enclosed with an aluminum panel and painted the same color as body.

## **LADDER LIFT INTERLOCK**

An interlock circuit shall be included on the ladder lift system to prevent the lift from raising if a specified hose bed or compartment doors are in the open position.

Storage shall be provided for the following;

- One (1) 24' 2-section ladder(s). Manufacturer, model number of the ladder shall be provided in equipment section of specification, or at pre-construction meeting when provided by Campbell County Fire Department.
- One (1) 14' roof ladder(s). Manufacturer, model number of the ladder shall be provided in equipment section of specification, or at pre-construction meeting when provided by Campbell County Fire Department.
- One (1) 10' folding ladder(s). Manufacturer, model number of the ladder shall be provided in equipment section of specification, or at pre-construction meeting when provided by Campbell County Fire Department.
- Two (2) NY Hooks. Manufacturer, model number of the NY Hoods shall be provided in equipment section of specification, or at pre-construction meeting when provided by Campbell County Fire Department.
- One (1) 10' length of hard suction hose. Hard suction hose(s) shall be supplied by contractor with completed unit. See equipment section.

## **FRONT PROTECTION PANELS**

To protect areas subject to intensive wear, scuffing or abuse, protection panels shall be installed on the front vertical body panels and wrapped around to the front compartment door opening. The protection panels shall be fabricated from 20 gauge brushed stainless steel.

# Campbell County Fire Department

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## **ROOF ACCESS LADDER**

The top of the body shall be accessible from the ground by a folding ladder. The ladder design will have a main ladder section, bolt on upper hand rail section and a folding lower step section for better angle of departure. Ladder stores in a folded position and then pulls out to a comfortable climbing angle. The ladder shall be parallel to the body when in the stored position.

Each cast aluminum step shall be 4-1/2" deep x 16" wide. Hand railing shall be 2-1/8" oval shaped aluminum tubing with a ribbed gripping surface.

The ladder shall be wired to the door ajar warning light in cab to warn the driver that the ladder is in the down position. Ladder shall be mounted to body with stainless steel bolts.

Ladder shall be located on rear streetside of the body.

## **WALKWAY/STEP LIGHTS**

There shall be two (2) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area. The lights shall be activated when the parking brake is set.

Each light shall be mounted in an extruded aluminum housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

## **WALKWAY EXTENSION STEP**

A full walkway width x 8.5" deep, bolt-on type extension step shall be provided for safe transition from specified ladder to center walkway area. Step shall be fabricated from 3/16" NFPA compliant treadplate aluminum with side gusset supports to body. The specified center rear marker lights shall be located on rear facing edge. The underside of step shall have an 28" OnScene LED light to light the bumper or compartment area below.

## **PUMP MODULE HANDRAILS**

There shall be one(1) 24" handrails, on curbside of pump module for access to upper dunnage area. Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

## **FOLDING STEP(S)**

There shall be four (4) Innovative Controls polished cast aluminum folding step(s) provided and installed on completed vehicle. Each step shall be heavy duty with stainless steel spring and textured step surface meeting NFPA standards. Each step shall include an LED light.

Location(s): Front of body streetside.

# Campbell County Fire Department

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## **LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC**

### General

Any low voltage electrical systems or warning devices installed on the fire apparatus shall be appropriate for the mounting location and intended electrical load.

Where wire passes through sheet metal, grommets shall be used to protect wire and wire looms. Electrical connections shall be with double crimp water-tight heat shrink connectors.

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

### Wiring

All electrical circuit feeder wiring supplied and installed by the fire apparatus manufacturer shall meet the requirements of NFPA Chapter 13.

The circuit feeder wire shall be stranded copper or copper alloy conductors of a gauge rated to carry 125% of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10%. The use of star washers for circuit ground connections shall not be permitted.

All circuits shall otherwise be wired in conformance with SAE J1292, *Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring*.

### Wiring and Wire Harness Construction

All insulated wire and cable shall conform to SAE J1127, *Low Voltage Battery Cable*, or SAE J1128, *Low Voltage Primary Cable*, type SXL, GXL, or TXL.

All conductors shall be constructed in accordance with SAE J1127 or SAE J1128, except where good engineering practice dictates special strand construction. Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application. Physical and dimensional values of conductor insulation shall be in conformance with the requirements of SAE J1127 or SAE J1128, except where good engineering practice dictates special conductor insulation. The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures. The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C), except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer's instructions. All ungrounded electrical terminals shall have protective covers or be in enclosures. Wire nut, insulation displacement, and insulation piercing connections shall not be used.

Wiring shall be restrained to prevent damage caused by chafing or ice buildup and protected against heat, liquid contaminants, or other environmental factors.

Wiring shall be uniquely identified at least every 2 ft (0.6 m) by color coding or permanent marking with a circuit function code. The identification shall reference a wiring diagram.

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Circuits shall be provided with properly rated low voltage over-current protective devices. Such devices shall be readily accessible and protected against heat in excess of the over-current device's design range, mechanical damage, and water spray. Circuit protection shall be accomplished by utilizing fuses, circuit breakers, fusible links, or solid state equivalent devices.

If a mechanical-type device is used, it shall conform to one of the following SAE standards:

- 1) SAE J156, *Fusible Links*
- 2) SAE J553, *Circuit Breakers*
- 3) SAE J554, *Electric Fuses (Cartridge Type)*
- 4) SAE J1888, *High Current Time Lag Electric Fuses*
- 5) SAE J2077, *Miniature Blade Type Electrical Fuses*

Switches, relays, terminals, and connectors shall have a direct current (dc) rating of 125% of maximum current for which the circuit is protected.

### Power Supply

A 12 V or greater electrical alternator shall be provided. The alternator shall have a minimum output at idle to meet the minimum continuous electrical load of the vehicle, at 200°F (93°C) ambient temperature within the engine compartment, and shall be provided with full automatic regulation.

### Minimum Continuous Electrical Load

The minimum continuous electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode during emergency operations:

- 1) The propulsion engine and transmission
- 2) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
- 3) The radio(s) at a duty cycle of 10 percent transmit and 90% receive (for calculation and testing purposes, a default value of 5 A continuous)
- 4) The lighting necessary to produce 2 fc (20 lx) of illumination on all walking surfaces on the apparatus and on the ground at all egress points onto and off the apparatus, 5 fc (50 lx) of illumination on all control and instrument panels, and 50 percent of the total compartment lighting loads
- 5) The minimum optical warning system, where the apparatus is blocking the right-of way
- 6) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
- 7) Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

If the apparatus is equipped to tow a trailer, an additional 45 A shall be added to the minimum continuous electrical load to provide electrical power for the federally required clearance and marker lighting and the optical warning devices mounted on the trailer.

The condition of the low voltage electrical system shall be monitored by a warning system that provides both an audible and a visual signal to persons on, in, or near the apparatus of an impending electrical system failure caused by the excessive discharge of the battery set.

The charge status of the battery shall be determined either by direct measurement of the battery charge or indirectly by monitoring the electrical system voltage.

If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery or at the master load disconnect switch drops below 11.8 V for 12 V nominal systems, 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds.

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A voltmeter shall be mounted on the driver's instrument panel to allow direct observation of the system voltage.

### Electromagnetic Interference

Electromagnetic interference suppression shall be provided, as required, to satisfy the radiation limits specified in SAE J551/1, *Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*.

### Wiring Diagram

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

### Low Voltage Electrical System Performance Test

A low voltage electrical system test certification shall be provided with delivered apparatus.

### **12 VOLT DIAGNOSTIC RELAY CONTROL CENTER**

The 12 volt power distribution shall be conveniently located with easy access for service. All relays and circuit breakers shall be plug-in type allowing for removal for repairs without necessitating soldering or tools. The sockets mounts for both the relays and circuit breakers shall be of a design that permits the use of standard automotive type components.

The 12 volt distribution panel shall utilize printed circuit boards mounted in high strength enclosure. Each printed circuit board shall be provided with twelve (12) heavy duty independent switching relays. Each relay shall have the ability to be configured either normally open or normally closed and be protected by a 20 amp automatic reset breaker. Each circuit will be provided with a LED for visual diagnostic.

Power distribution panel shall be located in apparatus body within a protected enclosure with removable or hinged cover.

### **CAB CONSOLE**

A center cab console shall be provided between the Driver's and Officer's seats extending to rear wall of cab. Console shall be as large as possible and fabricated of 1/8" smooth aluminum. A textured powder coat paint finish shall be provided for durability and finished appearance.

The rear portion of the console shall be provided with open top storage for notebooks or maps. Two (2) adjustable dividers shall be provided in the storage area. The forward portion of console shall be slanted for mounting of siren head, radio or 12 volt control panel, and etc, with easy access to both Driver and Officer. Four (4) cup holders shall be provided in console.

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## **ROCKER SWITCH PANEL**

The control of the 12 volt equipment installed on chassis and body shall be centrally located in the cab. The individual rocker style switches shall be located on a separate electrical panel, complete with backlit name tags describing function of each individual switch. The back lighting shall have two (2) levels of intensity, low level lights activated when the vehicle lights or ignition switch is turned "On", and high level lights activated when individual switch is turned "On". An internally lighted rocker switch shall be furnished to the left of specified emergency lighting switches, and identified as "MASTER EMERGENCY SWITCH".

Switch circuitry shall be on a printed circuit board. The lights shall be solid state type and have a 100,000 hour life span.

The following options shall be provided in specified console. Final layout to be determined by Campbell County Fire Department at pre-construction meeting.

recess mount radio chargers

- There shall be five (5) communications radio and/or siren 3" recess mount(s) with black powdercoat paint finish in specified console for the specified radios, siren and traffic arrow controllers.
- There shall be four (4) 12 VDC power plug(s) provided in specified console.
- There shall be five (5) Blue Sea 12 VDC USB port(s) provided in specified console.

## **ELECTRICAL SYSTEM MANAGER**

### **LOAD MANAGEMENT**

If the total continuous electrical load exceeds the minimum continuous electrical output rating of the installed alternator(s), an Innovative Controls automatic electrical load management system shall be required. The minimum continuous electrical loads shall not be subject to automatic load management.

The apparatus 12 volt electrical system shall be provided with a system manager for:

- Monitoring chassis battery voltage
- Shedding pre-determined electrical circuits
- Sequencing pre-determined electrical circuits
- Automatically controlling chassis engine fast-idle
- Monitor master switch and parking brake applications
- Automatically control warning light modes ("Calling-For" and "Blocking Right of Way")
- Provide low voltage alarm
- Programmable control circuits
- Remote system status indicator panel

System manager shall perform all electrical functions required by current NFPA 1901 Standards.

## **BATTERY MONITORING**

The system manager shall monitor the vehicle battery voltage. When electrical loads exceed the alternator output and the voltage drops, the load manager shall start shutting down electrical outputs. The system shall shut down only as many outputs required to maintain the system voltage. A special indicator to show different states of the electrical system by flashing at rate proportional to the battery discharge.



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## **LOAD SEQUENCING AND SHEDDING**

The system shall be capable of sequentially switching and shedding 12 volt loads. The Master light switch starts the sequential switch when it is turned "On". Likewise turning the Master Switch "Off" will sequentially de-energize the loads.

## **BATTERY SYSTEM**

The battery connectors shall be heavy duty type with cables terminating in heat shrink loom. Heavy duty battery cables shall provide maximum power to the electrical system. Where required, the cables shall be shielded from exhaust tubing and the muffler. Large rubber grommets shall be provided where cables enter the battery compartment.

Batteries shall be of the high-cycle type. With the engine off, the battery system shall be able to provide the minimum continuous electrical load for 10 minutes without discharging more than 50 percent of the reserve capacity and then to restart the engine. The battery system cold cranking amps (CCA) rating shall meet or exceed the minimum CCA recommendations of the engine manufacturer. The batteries shall be mounted to prevent movement during fire apparatus operation and shall be protected against accumulations of road spray, snow, and road debris. The batteries shall be readily accessible for examination, testing, and maintenance.

A means shall be provided for jump-starting the engine if the batteries are not accessible without lifting the cab of a tilt-cab apparatus.

Where an enclosed battery compartment is provided, it shall be ventilated to the exterior to prevent the buildup of heat and explosive fumes. The batteries shall be protected against vibration and temperatures that exceed the battery manufacturer's recommendation.

An onboard battery conditioner or charger or a polarized inlet shall be provided for charging all batteries. Where an onboard conditioner or charger is supplied, the associated line voltage electrical power system shall be installed in accordance with Chapter 22.

One of the following master disconnect switches shall be provided:

- 1) A master body disconnect switch that disconnects all electrical loads not provided by the chassis manufacturer
- 2) A master load disconnect switch that disconnects all electrical loads on the apparatus except the starter

Electronic control systems and similar devices shall be permitted to be otherwise connected if so specified by their manufacturer.

The alternator shall be wired directly to the batteries through the ammeter shunt(s), if one is provided, and not through the master load disconnect switch.

A green "battery disconnect on" indicator light that is visible from the driver's position shall be provided.

Rechargeable hand lights, radios, and other similar devices shall be permitted to be connected to the electrical system ahead of the master disconnect switch.

A sequential switching device shall be permitted to energize the optical warning devices and other high current devices required in minimum continuous electrical load, provided the switching device shall first energize the electrical devices required in minimum continuous electrical load within 5 seconds.

## **BATTERY SWITCH**

The chassis ignition key shall activate a heavy duty relay to provide 12 volt battery power to the vehicle. There shall be a green "BATTERY ON" pilot light that is visible from the driver's position.

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## **BATTERY SOLENOID**

Battery switch shall consist of a minimum 200 ampere, constant duty solenoid to feed from positive side of battery.

## **BATTERY CONDITIONER**

One (1) Kussmaul model 091-9-1000 Pump-Plus 1000, single battery charger/air compressor, with 120 VAC input, and 15 amp 12 VDC amp output battery conditioner with a 12 volt, 80 psi air compressor shall be provided and installed. This system shall monitor the condition of battery(s) and provide an electrical current at variable rates to overcome battery failure. The air compressor shall maintain air pressure in the chassis air brake system. A Kussmaul bar graph type indicator panel shall be provided for showing status of battery conditioner.

## **SHORE POWER INLET**

One (1) Kussmaul 120 VAC, 20 amp Super Auto-Eject shore power inlet(s) shall be provided. The shore power connection shall automatically disengage from vehicle when chassis ignition is engaged.

The protective ground from the shoreline inlet shall be bonded to the vehicle frame.

- The outlet cover shall be red.
- The shore power plug shall be located near the Driver door area.

## **ENGINE COMPARTMENT LIGHT**

There shall be one (1) OnScene Severe Service LED light(s) mounted in the engine compartment with integral switch with a light output of at least 20 candlepower (250 lumens). The engine compartment light(s) shall operate only when the master battery switch is turned "On".

## **CHASSIS HEADLIGHT WIG/WAG**

A chassis headlight wig/wag flashing unit shall be provided. The headlight flasher shall shut down when the parking brake is engaged for "Blocking Mode".

The lights shall be controlled at the switch panel in cab.

## **CAB HAZARD WARNING LIGHT**

Three (3) Truck-Lite red LED flashing light shall be provided and located in the driving compartment and be illuminated automatically whenever the vehicles parking brake is not fully engaged and any of the following conditions exist:

- One (1) for any passenger or equipment compartment door is not closed.
- One (1) for ladder or equipment rack is not in the stowed position.
- One (1) for hosebed cover and rear ladder and 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.

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Compartments and equipment meeting all of the following conditions shall be permitted to be exempt from being wired to the hazard light:

- The volume is less than or equal to 4 ft<sup>3</sup> (0.1 m<sup>3</sup>).
- The compartment has an opening less than or equal to 144 in.<sup>2</sup> (92,900 mm<sup>2</sup>).
- The open door does not extend sideways beyond the mirrors or up above the top of the fire apparatus.
- All equipment in the compartment is restrained so that nothing can fall out if the door is open while the apparatus is moving.
- Manually raised pole lights with an extension of less than 5 ft (1.5 m).

The hazard light shall be labeled "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

An audible alarm shall be provided for the warning lights.

### **BACK-UP ALARM**

The body manufacturer shall furnish and install an automatic sound sensing electronic back-up alarm. The back-up alarm shall actuate automatically when the transmission gear selector is placed in reverse. The alarm automatically adjusts its sound output, maintaining a minimum of ten dB(A) above noise level, up to maximum rated output of 112 dB(A).

### **REAR VIEW CAMERA**

There shall be one (1) ASA Voyager rear observation camera system provided and installed on completed unit. The system shall include one (1) model VCC150 high resolution CCD color camera installed on the rear body.

The camera image shall be displayed on a model AOM713, 7" color flat panel display (up to 3 camera inputs) located within the driver's range of view.

### **EVENT RECORDING CAMERA SYSTEM**

An FRC InView DS2 model SNA300-A00 Camera Vehicle Event Recording System shall be provided in chassis cab. The system shall include one (1) forward facing 4.0mm HD camera and one (1) interior remotely located 2.6mm IR camera. Mounting locations for each camera shall be determined at pre-construction meeting.

It shall feature main stream full resolution or second stream 360p or 180p resolution capabilities. The system shall feature (8) eight quality setting levels. It shall be capable of SD card storage up to 256 GB with a security cover for protection from SD card removal. The system shall feature (3) three memory override settings including auto-override, no override, and minimum days (in the range of 1-31 days). The system shall be Wi-Fi enabled and shall include built-in G-force sensor and GPS.

The system shall include a Microsoft® Windows-based player program offering a single and (2) two camera video viewing display modes (split screen), and shall feature advanced video playback options including: frame advance, FFD up to 16X, and slow FWD ½ to 1/16. It shall be user configurable via IOS and Android mobile Apps. The system shall provide video playback including time, speed, vehicle number, GPS location, channel name, and device ID.

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## **TAIL LIGHTS**

Rear body tail lights shall be vertically mounted and located per Federal Motor Vehicle Safety Standards, FMVSS and Canadian Motor Vehicle Safety Standards CMVSS. The following lights shall be provided;

- Two (2) Whelen C6T amber LED sequential arrow turn signal lights, amber lens
- Two (2) Whelen C6BTT red LED brake and tail lights, red lens
- Two (2) Whelen C6LCC white LED back-up lights, clear lens

Each of the lights above shall be mounted in a C6FC, chrome finish bezels.

## **MIDSHIP MARKER/TURN SIGNAL**

Two (2) Whelen model T0A00MAR 2" round amber LED midship body clearance marker/turn signal lights shall be provided and installed, one (1) light on each side of the body, in forward wheel well of rear axle. Midship marker/turn lights shall be wired to the headlight circuit of the chassis.

## **MARKER LIGHTS**

The body shall be equipped with all necessary side and rear clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS). Clearance lights shall be Truck-Lite model 18 series, 3 diode LED, reflectorized type to reduce the need for maintenance and lower the amp draw. Clearance lights on body shall be connected to the clearance light circuit of the chassis.

## **CAB STEP LIGHTS / GROUND LIGHTS**

There shall be four (4) OnScene 8" Access LED light(s) installed on the vehicle capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting designed to provide illumination on areas under the driver and crew riding area exits shall be switchable but activated automatically when the exit doors are opened.

## **LICENSE PLATE LIGHT**

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

## **ELECTRONIC SIREN**

One (1) Whelen model 295SLSA1 electronic siren control with selectable 100 or 200 watt output, hands-free operation, user selectable siren tones, park kill, and standard hard wired microphone shall be provided and installed in cab within easy reach of Driver. Siren power shall be wired through the master warning light switch.

## **SIREN SPEAKER**

One (1) Whelen model SA314A 100 watt aluminum, 6.4" x 6.1" x 3.1" deep siren speaker shall be provided and located behind grill or front bumper with natural aluminum finish. The solid state siren speaker shall be vibration resistant. The SA314A shall comply with California Title XIII, Class A, and SAE J1849 requirements and with OSHA 1910.95 Guidelines regarding "Permissible Noise Exposure". All mounting hardware shall be stainless steel and covered by a two year factory warranty.

The siren speaker shall be located on the streetside of front bumper.

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## **FRONT LED FLOODLIGHT**

One (1) Rigid Industries E-Series model 130312, 30" combination spot/flood LED light(s) with black housing color and cradle mount brackets shall be provided on front of vehicle. The E-Series 30" LED light(s) shall have 13,800 lumen output each.

Each light shall be wired directly to the 12 VDC electrical system with stranded copper wire. The floodlights shall be protected with circuit breakers rated at the proper amperage and wire size.

The lights shall be controlled at the switch panel in cab.

## **SIDE LED SCENE LIGHTS**

There shall be four (4) Whelen 900 Series Super-LED® model C9SL, 9" x 7" surface mounted scene light(s) provided on the upper body. Light quantity shall be divided equally per side. The 900 configuration shall consist of 36 white Super-LEDs and a clear non optic polycarbonate lens with metalized SurfaceMax reflector with integrated optic collimators for maximum output. The 900 series light shall have 6,500 useable lumens each. Each light shall have a chrome flange. The scene light is covered by a five year factory warranty.

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

The lights shall be controlled at the switch panel in cab.

## **REAR LED SCENE LIGHTS**

Two (2) Whelen 900 Series Super-LED® model C9SL, 9" x 7" surface mounted scene lights shall be provided on the upper rear body to light the work area immediately behind the vehicle. The 900 configuration shall consist of 36 white Super-LEDs and a clear non optic polycarbonate lens with metalized SurfaceMax reflector with integrated optic collimators for maximum output. The 900 series light shall have 6,500 useable lumens each. Each light shall have a chrome flange. The scene light is covered by a five year factory warranty.

The above scene lights shall light to a level of at least 3 fc (30 lx), measured at 25 equally spaced points on a 2.5 ft (750 mm) grid with in a 10 ft x 10 ft (3 m x 3m) square to the rear of vehicle.

The lights shall be controlled at the switch panel in cab.

The rear scene lights shall also be activated when the apparatus is in reverse.

## **TRAFFIC ADVISOR LIGHTS**

A traffic advisor system shall be provided on rear of vehicle using; six (6) Whelen Wide-angle ION series amber Super-LED lights with clear lens, and 25 Scan-Lock™ flash patterns. Lights shall be individually mounted with chrome bezels and evenly distributed to rear, if split by a hose bed, or walkway.

Center (2) will be split/ brake light

The lights shall be controlled by a Whelen TACTL5 control located in cab dash or center console area and provide; Left Arrow, Right Arrow, Center Out, and Wig-Wag patterns. The LED display on the control head shall replicate the Traffic Advisor's directional sequence. The TACTL5 shall have a rear panel dip switch for the ability to set eight additional Scan-Lock™ flash patterns. The wig-wag light pattern shall be activated with the E-Master and can be switched to the other patterns at any time through the control panel.

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## **WARNING LIGHT PACKAGE**

Each apparatus shall have a system of optical warning devices that meets or exceeds the requirements of this section.

The optical warning system shall consist of an upper and a lower warning level. The requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four (4) warning zones. The four zones shall be determined by lines drawn through the geometric center of the apparatus at 45 degrees to a line drawn lengthwise through the geometric center of the apparatus. The four (4) zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the apparatus.

Each optical warning device shall be installed on the apparatus and connected to the apparatus's electrical system in accordance with the requirements of this standard and the requirements of the manufacturer of the device.

A master optical warning system switch that energizes all the optical warning devices shall be provided.

The optical warning system on the fire apparatus shall be capable of two (2) separate signaling modes during emergency operations. One (1) mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One (1) mode shall signal that the apparatus is stopped and is blocking the right-of-way. The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission. When the master optical warning system switch is closed and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized. When the master optical warning system switch is closed and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized. The system shall be permitted to have a method of modifying the two (2) signaling modes.

The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s). The front optical warning devices shall be placed so as to maintain the maximum possible separation from the headlights.

Steadily burning, non flashing optical sources shall be permitted to be used.

## **UPPER LEVEL OPTICAL WARNING DEVICES**

The upper-level optical warning devices shall be mounted as high and as close to the corner points of the apparatus as is practical to define the clearance lines of the apparatus. The upper-level optical warning devices shall not be mounted above the maximum height, specified by the device manufacturer.

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## ZONE A - FRONT WARNING LIGHTS

There shall be one (1) Whelen Justice JE0NFPA LED 62" lightbar permanently mounted to the cab roof. The lightbar configuration (streetside to curbside) shall be:

<u>SECTION</u>	<u>INTERNAL COMPONENTS</u>	<u>LENS COLOR</u>
1	Red Rear Corner Linear LED	Clear
2	Red Front Corner Linear LED	Clear
3	Red Linear LED	Clear
4	Clear Linear LED	Clear
5	Red Linear LED	Clear
6	Blank	Clear
7	Blank	Clear
8	Red Linear LED	Clear
9	Clear Linear LED	Clear
10	Red Linear LED	Clear
11	Red Front Corner Linear LED	Clear
12	Red Rear Corner Linear LED	Clear

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

The lightbar(s) shall be separately controlled at switch panel in the cab.

## ZONES B AND D - SIDE WARNING LIGHTS

### UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen M6 series Super-LED lights provided; one (1) red, and one (1) blue each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

### UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen M6 series Super-LED lights provided; one (1) red, and one (1) blue each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

## ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen C9 SurfaceMax series (9" x 7") red Linear Super-LED with full-fill optic lights provided, one (1) each side. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange. The lights shall be controlled at the switch panel in cab.

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## LOWER LEVEL OPTICAL WARNING DEVICES

To define the clearance lines of the apparatus, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front axle centerline and as close to the front corner points of the apparatus as is practical.

The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corners of the apparatus as is practical. The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground for large apparatus, and 18 in. and 48 in. (460 mm and 1600 mm) above level ground.

A midship optical warning device shall be mounted right and the left sides of the apparatus if the distance between the front and rear lower-level optical devices exceeds 25 ft (7.6 m) at the optical center. Additional midship optical warning devices shall be required, where necessary, to maintain a horizontal distance between the centers of adjacent lower-level optical warning devices of 25 ft (7.6 m) or less. The optical center of any midship mounted optical warning device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

## ZONE A - FRONT WARNING LIGHTS

There shall be two (2) Whelen C6 SurfaceMax series (6" x 4") red Linear Super-LED with full-fill optic lights provided, one (1) on front grill and one on front bumper. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

There shall be two (2) Whelen C6 SurfaceMax series (6" x 4") blue Linear Super-LED with full-fill optic lights provided, one (1) on front grill and one (1) on front bumper. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

The lights to be arranged in a "X" pattern per color.

The lights shall be controlled at the switch panel in cab.

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

There shall be one (1) Whelen ION Wide Series (6" x 1 3/4") red Super-LED surface mount light (WIONSMCR) provided on curb side. The wide angle warning light shall incorporate six red Super-LEDs. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

There shall be one (1) Whelen ION Wide Series (6" x 1 3/4") blue Super-LED surface mount light (WIONSMCB) provided on street side. The wide angle warning light shall incorporate six red Super-LEDs. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.



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

There shall be one (1) Whelen ION Wide Series (6" x 1 3/4") red Super-LED surface mount light (WIONSMCR) provided on street side. The wide angle warning light shall incorporate six red Super-LEDs. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

There shall be one (1) Whelen ION Wide Series (6" x 1 3/4") blue Super-LED surface mount light (WIONSMCB) provided on curb side. The wide angle warning light shall incorporate six red Super-LEDs. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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

There shall be one (1) Whelen ION Wide Series (6" x 1 3/4") blue Super-LED surface mount light (WIONSMCB) provided on street side. The wide angle warning light shall incorporate six red Super-LEDs. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

There shall be one (1) Whelen ION Wide Series (6" x 1 3/4") red Super-LED surface mount light (WIONSMCR) provided on curb side. The wide angle warning light shall incorporate six red Super-LEDs. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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

There shall be two (2) Whelen C6 SurfaceMax series (6" x 4") Linear Super-LED with full-fill optic lights provided, one (1) blue LED curb side and one (1) red LED street side.. The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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## **WILDLAND SIDE MOUNT PUMP MODULE**

The 74" (measured laterally across vehicle width) x 36" wide side mount pump enclosure shall be removable and supported from the chassis frame rails with spring type body mounts. This enclosure shall allow independent flexing of the pump enclosure from the body and allow for quick removal. The support structure shall be constructed of extruded aluminum tubing and angle.

All pump suction and discharge controls are to be mounted on the driver side pump operator's panel so as to permit operation of the pump from a central location. The fire pump, valves and controls shall be accessible for service and maintenance as required by applicable sections of NFPA standards.

The "master" gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel, allowing access to the backside of all gauges and gauge lines. The individual gauges shall be mounted inline with the control handle or adjacent to the control handle. Panel is to include a stainless steel piano hinge, flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened.

The following controls and equipment shall be provided on the pump panel or within the pump enclosure:

- Primer system.
- Pump and plumbing area LED service light(s).
- Pressure control device and/or throttle control.
- Fire pump and engine instruments.
- Pump intakes and discharge controls.
- Master intake and discharge gauges.
- Tank fill control.
- Tank suction control.
- Water tank level gauge.
- Pump panel LED light(s).

## **PUMP COMPARTMENT SERVICE ACCESS**

The front portion of the pump compartment structure (directly behind the chassis cab) shall not be overlaid to provide an opening for access to the midship fire pump.

## **PUMP PANEL - SIDE MOUNT**

The pump operator's panel, along with the lower streetside and curbside pump panels shall be constructed of smooth plate aluminum with powder coated paint finish, fastened to the pump enclosure with 1/4" stainless steel bolts.

The instrument area shall have a stainless steel continuous hinge that shall swing towards the front of the module for easy access to gauges.

## **STREETSIDE PUMP PANEL - BOLTED**

The streetside pump panel shall be fastened to the pump enclosure with 1/4" stainless steel bolts and nutserts.

## **LOWER CURBSIDE PUMP PANEL - BOLTED**

The curbside pump panel shall be fastened to the pump enclosure with 1/4" stainless steel bolts and nutserts.

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## **PUMP MODULE EQUIPMENT STORAGE COMPARTMENT**

There shall be one (1) equipment compartment located on the upper curbside of the pump module. It shall have dimensions of 22" wide x 26" high. The clear door compartment dimensions shall be 20.5" wide x 23" high x 12" deep with the door closed. An OnScene LED light shall illuminate the interior of the compartment when the door is open.

The equipment compartment shall be provided with a flush style hinged door. The doors shall be provided with a high quality, continuous double seal type weather stripping to prevent moisture and dust from entering the exterior compartment. The door shall be double pan design with the outer door material being 1/8" aluminum door with a 1/8" aluminum removable inner liner that shall have a natural finish to provide reflective qualities during night operations. The vertically hinged door shall have a gas shock and polished stainless steel 1/4" piano hinge.

The door latch shall be an Eberhard locking slam latch, with a chrome "D" ring with a 5-degree bend for easier grasping of each door handle with gloved hands. The door shall be provided with a keyed lock.

The exterior of the door shall be painted to match the lower job color. The interior shall be painted to match the compartment interior paint specified.

There shall be two (2) large removable panels provided on the inside of the compartment. These panels shall provide an opening for service access to the right side of the interior of the pump module and to the bottom side of the diesel pump.

## **WHEEL CHOCK COMPARTMENT**

Below the equipment storage compartment shall be a wheel chock compartment. This compartment shall be equipped with a plate lap style 1/8" aluminum door mounted on a piano hinge with a push latch. The compartment shall have clear door dimensions of 8.3" wide x 13.5" high x 13-.5" deep with the door closed.

## **PUMP COMPARTMENT TOP OVERLAY**

The top of the pump compartment shall be overlaid with materials of a non slip 1/8" NFPA compliant aluminum treadplate.

## **DUNNAGE AREA**

A single wall 3/16" aluminum diamond plate dunnage area shall be provided above the pump house compartment for equipment mounting and storage space. The dunnage area shall be as wide as possible from side to side, and as deep as allowed with the available space.

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## **CURBSIDE PUMP MODULR COMPARTMENT**

A compartment shall be provided on curbside pump module above pump panel. Compartment shall be made as large as possible.

This compartment shall have a Locking slam door.

- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch.
- There shall be NO keyed lock on this compartment door.

## **COMPARTMENT LAYOUT**

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.

## **STREETSIDE RUNNING BOARD - SIDE MOUNT PANEL**

The streetside pump panel shall be equipped with a side running board. The running board shall extend along the width of the pump module.

The running board stepping surface shall be constructed of aluminum NFPA compliant tread plate, bolted in place with stainless steel fasteners.

The running board shall contain a hose well with a minimum of 9" width designed to carry 25' of 5.0" soft suction hose with hold down provisions.

Two (2) OnScene Velcro style straps shall be provided to hold suction hose in place.

A safety sign FAMA22, which warns of the need to secure hose, shall be visible to personnel at each hose storage area.

One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.

## **CURBSIDE RUNNING BOARD - SIDE MOUNT PANEL**

The curbside pump panel shall be equipped with a side running board. The running board shall extend along the width of the pump module.

The running board stepping surface shall be constructed of aluminum NFPA compliant tread plate, bolted in place with stainless steel fasteners.

The running board shall contain a hose well with a minimum of 9" width designed to carry a 25' of 5.0" soft suction hose with hold down provisions.

Two (2) OnScene Velcro style straps shall be provided to hold suction hose in place.

A safety sign FAMA22, which warns of the need to secure hose, shall be visible to personnel at each hose storage area.

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- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.

## **PUMP MODULE FINISH**

The pump module framework shall be painted body color choice. (RED)

## **PUMP HEAT PAN ENCLOSURE - ALUMINUM**

An aluminum heat pan shall be provided to enclose the bottom of the pump compartment. Aluminum material shall be used to prevent rust and corrosion that is commonly found in pans made of steel. The assembly shall completely enclose the underside of the pump to aid in the prevention of freezing in winter weather. The bottom of this enclosure shall be designed to be easily removed without the need to remove any bolts or fasteners. For ease of handling, the bottom enclosures shall be installed in two (2) sections. One (1) section shall slide out each side for maintenance and pump compartment clean-out.

## **PUMP MODULE HEATER**

The pump module shall be provided with one (1) Red Dot 35,000 BTU hot water type heater(s). The heater(s) shall be connected to the chassis engine cooling system and have three-speed, 12 volt blower. The cooling system lines shall be insulated and be provided with 1/4 turn shut-off valves to isolate system, if required.

The pump operator's panel shall have an Innovative Controls switch panel for heat control switch with indicator light. Switch shall be constantly illuminated and labeled.

## **CROSS LAY**

The specified pump module shall have three (3) cross lay(s). The cross lay hose bed(s) shall be located in the upper portion of the pump module.

The cross lay area shall be located at the front of side control pump module and at the rear of top control module. The cross lay area shall span the entire width of the pump module.

## **CROSS LAY TRIM**

Brushed stainless steel trim shall be installed at the openings on each side of the cross lay hose bed area. The trim shall reduce the chaffing of the hose jacket on the edges of the bay area.

If divider(s) are required between the hose bed areas they shall be fabricated from 3/16" smooth aluminum and mounted in a channel on each end for adjustability.

Removable slotted aluminum flooring shall be provided for the hose bed area.

Each end of hose bed shall have a 2" black nylon covered with black 14 oz. vinyl style webbing covers. The covers will be mechanically fastened at the sides of the hose bed and secured using yellow pulls with reflective bungees and shoulder bolts.

Safety sign FAMA22, which warns of the need to secure hose, shall be visible to personnel at each side of hose storage area.

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## **HOSE STORAGE LIGHTS**

There shall be three (3) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the hose storage area. The lights shall be activated when the parking brake is set.

Each light shall be mounted in an extruded aluminum housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

## **CROSS LAY BED COVER**

A 1/8" aluminum tread plate hinged cover shall be provided over the lay beds complete with full length stainless steel piano hinge. Stops shall be provided to protect cab or other adjacent body components. The hinge shall be located on the forward section of the cover, closest to the chassis cab.

## **WATEROUS CXS 1,000 GPM FIRE PUMP**

A Waterous Model CXS fire pump shall be midship mounted and shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA 1901, and shall have a rated capacity of 1,000 GPM.

The CXS is capable of supplying volumes up to 1,500 GPM (6000 L/min) @ 150 psi (10.3 bar). When installed in vehicle, complete with proper intake piping, CXS meets NFPA 1901 for a 1,000 GPM rating.

### Casing:

Two-piece, vertically-split, high-tensile, close grained gray iron.

### Impeller:

Bronze impeller specifically designed for the fire service, double hubbed to eliminate axial thrust, and accurately balanced for vibration-free running. Impellers with flame-plated hubs for extreme wear resistance are optional.

### Wear Rings:

Replaceable bronze wear rings to increase pump life and keep maintenance costs at a minimum.

### Impeller Shaft:

Stainless steel, heat treated, precisely ground to size, and polished under shaft seal. Supported by oil-lubricated ball bearings.

### Shaft Seal:

Face-type, self-adjusting, corrosion and wear resistance mechanical seal is standard

### Intake Connection:

Victaulic Intake CXV 6" or optional Dual Intake CXS 6"

### Bearings:

All bearings are oil or grease lubricated, ball-type, located outside the pump casting to accurately align and support the impeller shaft assembly. Ball bearings are deep groove type designed to carry both radial and axial thrust.

### PA Series:

PA Series transmission is normally used when a truck transmission mounted power take-off is selected as the pump drive. Designed for use with Allison transmissions with 10-bolt PTO.

Housing: High-strength aluminum

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Chain: Morse HV®, high-strength involute chain

## Pump Anodes:

There shall be two (2) anodes provided to protect the components that come in contact with the water system from corrosion and deterioration. One (1) anode shall be installed in the inlet (suction) side of system, and one (1) shall be installed in the pressure (outlet) side of the PTO pump.

## **PAINT FINISH**

The pump manufacturer shall provide a black finish paint.

## **PUMP DRIVE SYSTEM - PUMP AND ROLL**

The water system pump shall be driven by a Chelsea "Hot-Shift" transmission PTO and mounted directly to the transmission of the chassis. The drive line shall be hollow tube type, with heavy duty universals and splined shaft to allow movement of the chassis components and pump.

The engagement of the PTO shall be in the chassis cab with a rocker switch and red pilot light to note engagement of the PTO. The power supply to the PTO engagement control shall be wired to allow pump and roll operations.

The vehicle is designed to be used in both stationary pumping mode and "pump-and roll" pumping mode, an "OK to Pump-and-Roll" indicator shall be provided in the driving compartment to indicate that all of the following conditions have been met to safely operate the pump in pump-and-roll mode:

- 1) The pump shift is engaged.
- 2) The parking brake is released.

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

The "Throttle Ready" indicator at the pump operator's panel shall be permitted to indicate when the parking brake is engaged and, if the apparatus is equipped with an automatic transmission, when the chassis transmission is in neutral.

Model part number shall be Chelsea 280 series.

Double check the model number and ratio with engineering before ordering the PTO on the chassis.

## **MECHANICAL SEALS**

The pump shall be equipped with self-adjusting, maintenance free mechanical shaft seals that shall not require manual adjustment. These seals shall be designed in a manner such that they shall remain functional enough to permit continued use of the pump in the unlikely event of a seal failure.

## **1/2" PUMP COOLER LINE**

There shall be a 1/2" line installed from the discharge side of the pump to the water tank. The line shall be used to cool the pump during long periods of pumping when water is not being discharged. The pump cooler shall be controlled with a quarter-turn ball valve on main pump panel, and shall be clearly labeled "Pump Cooler".

## **PUMP COOLER CHECK VALVE**

There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **WATEROUS FIVE YEAR PUMP WARRANTY**

The fire pump shall be warranted by Waterous for a period of five (5) years from the date of delivery to the Campbell County Fire Department.

## **FIRE PUMP TEST**

The pump shall undergo a fire pump test per applicable sections of NFPA 1901 or 1906 standards, prior to delivery of the completed apparatus.

The test shall include at least the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and a vacuum test.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 psi (3400 kPa) for a minimum for 10 min.

The pump shall be capable of producing fire streams that are free from objectionable pulsation under all normal operating conditions.

The results of this test shall be furnished with the vehicle on delivery.

## **FIRE PUMP TEST LABEL**

A test plate shall be provided at the pump operator's panel that gives the rated discharges and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump as used, and the governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve

## **SAFETY SIGN**

A safety sign FAMA25, which warns of the need for training prior to operating the apparatus, shall be located on the pump operators panel.

## **ALTITUDE REQUIREMENT**

The apparatus shall be designed to meet the specified rating at 4,000 feet (1,220 meters) altitude.

## **PUMP DRAIN CONTROL**

The pump drain shall be controlled at the pump operator's panel and identified as "Pump Drain". The control shall be a Class1 round 1/4 turn handle control that is easily actuated with a gloved hand.



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## **AIR PRIMING PUMP CONTROL AT PUMP PANEL**

The priming pump shall be a Trident Emergency Products compressed air powered, high efficiency, multi-stage venturi based AirPrime System.

The priming pump shall be rigidly attached to the pump transmission and utilizes air supplied from the chassis air system to operate the pump primer. The AirPrime is more efficient and reliable than the conventional electric motor driven primers, and virtually eliminates the impact load on the vehicles electrical system improving the reliability of the vehicle. AirPrime also improves performance in the elapsed time for establishing water supply resulting in improved fire ground operations and safety.

A manual rocker switch with Auto-Prime / Off / Manual-Prime shall be provided on main pump operator's panel.

The primer shall be capable of priming the pump through a 20' section of suction hose with a 10' lift within 30 seconds for pumps less than 1,500 gpm, and 45 seconds for pumps 1,500 gpm and larger.

## **DISCHARGE RELIEF VALVE**

The discharge pressure relief shall be controlled by the electronic engine controlled device as specified.

## **6" SUCTION INLET - STREETSIDE**

One (1) 6" (150 mm) un-gated suction intake shall be installed on the streetside pump panel to supply the fire pump from an external water supply. The threads shall be 6" NH male threads.

The intake shall be provided with a removable screen.

## **BALL INTAKE VALVE (BIV)**

Master discharge shall be provided with a Task Force Tips model #AB7NR-NX Ball Intake Valve. The 30° intake elbow swivels 360° and has multiple positive detents. The aluminum castings are hardcoat anodized, and TFT-powder coat finished inside and out for maximum corrosion protection. All the components on the wet side of the valve are made of stainless steel for additional corrosion protection. The hand wheel needs 7-1/2 turns to open, meeting NFPA slow close requirements. There is a unique position indicator that shows the operator if the valve is open, closed or somewhere in between. The hand wheel is installed on the right side of the valve, but can be switched to the left side if desired. The unit comes equipped with a rugged 3/4-inch (19mm) drain valve to quickly drain water from the valve housing. A port for an optional air bleed valve is incorporated into the design for user friendly configurability. Hose couplings and truck connections are attached to the valve using polymer bearing rings which provide electrical isolation to help prevent galvanic corrosion. Includes TFT's new adjustable pressure relief valve with a discharge that can be directed one of four ways and meets NFPA 1901. Cap lanyard anchor point is standard.

The connections shall be a 4-1/2" FNH swivel rocker lug and a 6" FNH swivel long handle connection on master discharge. The unit shall be covered by a five-year warranty.

## **6" SUCTION INLET - CURBSIDE**

One (1) 6" (150 mm) un-gated suction intake shall be installed on the curbside pump panel to supply the fire pump from an external water supply. The threads shall be 6" NH male threads.

The intake shall be provided with a removable screen.

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## **BALL INTAKE VALVE (BIV)**

Master discharge shall be provided with a Task Force Tips model #AB7NR-NX Ball Intake Valve. The 30° intake elbow swivels 360° and has multiple positive detents. The aluminum castings are hardcoat anodized, and TFT-powder coat finished inside and out for maximum corrosion protection. All the components on the wet side of the valve are made of stainless steel for additional corrosion protection. The hand wheel needs 7-1/2 turns to open, meeting NFPA slow close requirements. There is a unique position indicator that shows the operator if the valve is open, closed or somewhere in between. The hand wheel is installed on the right side of the valve, but can be switched to the left side if desired. The unit comes equipped with a rugged 3/4-inch (19mm) drain valve to quickly drain water from the valve housing. A port for an optional air bleed valve is incorporated into the design for user friendly configurability. Hose couplings and truck connections are attached to the valve using polymer bearing rings which provide electrical isolation to help prevent galvanic corrosion. Includes TFT's new adjustable pressure relief valve with a discharge that can be directed one of four ways and meets NFPA 1901. Cap lanyard anchor point is standard.

The connections shall be a 4-1/2" FNH swivel rocker lug and a 6" FNH swivel long handle connection on master discharge. The unit shall be covered by a five-year warranty.

## **HEAT EXCHANGER**

A heat exchanger shall be provided by the cab chassis manufacturer on the pump driving engine cooling system that permits water from the discharge side of the pump to cool the coolant circulating through the engine cooling system without intermixing. The heat exchanger should maintain the temperature of the coolant in the pump drive engine not in excess of the engine manufacturer's temperature rating under all pumping conditions. A drain(s) should be provided to allow draining of the heat exchanger to prevent damage from freezing.

The cooling system shall be controlled by a 1/4 turn valve on the pump operator's panel.

## **INTAKE RELIEF VALVE**

There shall be an Elkhart model 40-10 brass intake relief valve installed on the suction side of the pump. The system shall be adjustable from 75 to 250 PSI and shall be designed to prevent vibration from altering the setting of the pilot valve. The system shall be factory set at 150 PSI prior to delivery.

The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2" NSTM connection. The discharge shall be away from the pump operator and labeled "DO NOT CAP".

## **AUXILIARY PUMP**

No auxiliary pump shall be provided with completed unit.

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Type 3 Engine, SVI #1103-1104

## **FOAM SYSTEMS**

There shall be a FoamPro 1601 foam system with a 12 VDC, 1/3 hp electric motor driven positive displacement piston type foam concentrate pump with a rated capacity of .01 to 1.0 gpm @ 200 psi, with operating pressures up to 400 psi. The system will draw a maximum of 30 amps @ 12 VDC.

The apparatus shall be equipped with an electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrate. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. System must be capable of delivering accuracy to within 5% of calibrated settings over the advertised operation range when installed according to factory standards. The system shall be equipped with a control module suitable for installation on the pump panel. Incorporated within the motor driver shall be a microprocessor that receives input from the system flowmeter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

A paddlewheel-type flowmeter shall be installed in the discharge system specified to be "foam capable." A simulated flow feature shall be incorporated into the motor driver to simulate an approximate flow value of 100 gpm. This feature is to be engaged or disengaged with a momentary switch and will automatically disengage when the main system switch is turned off.

The control module shall enable the pump operator to:

<ul style="list-style-type: none"><li>• Activate the foam proportioning system</li><li>• Select proportioning rates from 0.1% to 1.0%</li></ul>	<ul style="list-style-type: none"><li>• See a "low concentrate" warning light flash when the foam tank runs low and in two minutes, if foam concentrate is not added to the tank, shut the foam concentrate pump down</li></ul>
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A 12 VDC electric motor driven positive displacement plunger pump shall be provided. The pump capacity shall be from 0.1 gpm (0.38 L/min) to 1.0 gpm (3.8 L/min) at 200 psi (13.8 BAR) with a maximum operating pressure up to 400 psi (27.6 BAR). The pump shall have the capability to draw 3 foot of lift. The system will draw a maximum of 30 amps @ 12 VDC. The motor shall be controlled by the microprocessor (mounted to the base of the pump). It shall receive signals from the control module and power the 1/3 hp (.25 kW) electric motor in a variable speed duty cycle to ensure that the correct proportion of concentrate is injected into the water stream. A full flow check valve shall be provided in the discharge piping to prevent foam contamination of fire pump and water tank. A 12 psi (.83 BAR) opening pressure check valve shall be provided in concentrate line.

Components of the complete proportioning system as described above shall include:

<ul style="list-style-type: none"><li>• Operator control module</li><li>• Paddlewheel flowmeter</li><li>• Pump and electric motor/motor driver</li><li>• Wiring harnesses</li></ul>	<ul style="list-style-type: none"><li>• Low level tank switch</li><li>• Foam tank</li><li>• Foam injection check valve</li><li>• Main waterway check valve</li></ul>
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An installation and operation manual shall be provided for the unit, along with a one-year limited warranty by the manufacturer. The system must be installed and calibrated by a Certified FoamPro Dealer. The system design shall have passed environmental testing which simulates heavy use on off-road mobile apparatus. Testing shall have been conducted in accordance to SAE standards.

A means shall be provided to prevent water back flow into the foam proportioning system and the foam concentrate storage tank.

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## **HOSE THREADS**

Hose threads shall be National Standard (NST) on all base threads on the apparatus intakes and discharges, unless otherwise specified. (NST and NH are the same thread)

## **PLUMBING SPECIFICATIONS**

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

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

## **STAINLESS STEEL INTAKE MANIFOLD**

The suction manifold assembly shall be fabricated with Schedule 10 type 304 stainless steel. All threaded fittings shall be a minimum of Schedule 10 stainless steel. The suction manifold assembly shall have radiused sweep elbows to minimize water turbulence into the suction volute.

The suction manifold shall be welded and pressure tested prior to installation. The stainless steel manifold assembly shall be attached to the pump intake volute with a heavy-duty, flexible Victaulic coupling.

The entire intake piping system, valves, bleeder valves, and intake closures, excluding the tank-to-pump line on the tank side of the valve, shall be capable of withstanding a hydrostatic pressure of 250 psi (1700 kPa).

## **STAINLESS STEEL DISCHARGE MANIFOLD**

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

The manifold shall be welded and pressure tested prior to installation. The stainless steel manifold assembly shall be attached to the pump intake volute with a heavy-duty, flexible Victaulic coupling.

The entire discharge piping system; valves; drain cocks; and outlet closures, excluding the tank fill line on the tank side of the valve and CAF system piping and components that include valves that permit isolation from discharge pressure, shall be capable of withstanding a hydrodynamic discharge pressure of 500 psi (3400 kPa) or 100 psi (700 kPa) over the maximum discharge pressure capability rating of the pump, whichever is greater.

## **PLUMBING SYSTEM FINISH**

The plumbing system shall not be painted. The piping and valves shall remain natural color.

## **STAINLESS STEEL PLUMBING WARRANTY**

The stainless steel plumbing shall be free of defects in material and workmanship for a period of ten (10) years, or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

The contractor shall supply details of their warranty information with their bid submission.

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## INTAKES

The pump shall have a sufficient number and size of intakes to perform the apparatus pump system certification test.

If the couplings on the suction hose carried on the apparatus are of a different size from that of the pump intake(s) or have means of hose attachment other than that provided on the intake(s), an adapter(s) shall be provided to allow connection of the suction hose to the pump intake(s).

Safety sign FAMA25, which warns of the need for training prior to operating the apparatus, shall be located on pump operator's panel.

Each intake shall have a removable or accessible strainer inside the connection. The strainer(s) shall restrict spherical debris that is too large to pass through the pump.

At least one (1) valved intake shall be provided that can be controlled from the pump operator's position. The valve and piping shall be a minimum 2-1/2 in. (65 mm) nominal size. If the intake is 2-1/2 in. (65 mm) nominal size, the intake shall be equipped with a female swivel coupling with NH threads.

Any 3 in. (75 mm) or larger intake valve except the tank-to-pump intake valve shall be a slow-operating valve.

Each valved intake shall be equipped with a bleeder valve having a minimum 3/4 in. (19 mm) pipe thread connection to bleed off air or water. The bleeder valve shall be operational without the operator having to get under the apparatus. If a valved appliance is attached to an intake, it shall be equipped with a 3/4 in. (19 mm) bleeder valve on each intake. Bleeder valves for valved intakes 4 in. (100 mm) and larger not located at the pump operator's panel shall be located where the bleeder valve controls are visible and operationally functional while the operator remains stationary at the valved intake position.

Each valved intake having a connection size larger than 3 in. (75 mm) shall be equipped with an adjustable automatic pressure relief device installed on the supply side of the valve to bleed off pressure from a hose connected to the valved intake. The automatic pressure relief device shall be adjustable from a minimum of 90 psi (620 kPa) to at least 185 psi (1275 kPa). The pressure relief device, when preset at 125 psi (860 kPa), shall not allow a pressure rise greater than 60 psi (400 kPa) at the device inlet while flowing a minimum of 150 gpm (570 L/min). The pressure relief device shall discharge to atmosphere.

All intakes shall be provided with caps or closures capable of withstanding a hydrostatic gauge pressure of 500 psi (3400 kPa). Intakes having male threads shall be equipped with caps. Intakes having female threads shall be equipped with plugs. Where adapters for special threads or other means for hose attachment are provided on the intakes, closures shall be provided for the adapters in lieu of caps or plugs. Caps, plugs, or closures for 3-1/2 in. (90 mm) and smaller intakes shall remain secured to the apparatus when removed from the intakes.

If the suction inlets are to be equipped with a valve, Siamese, or adapter that will remain in place while the apparatus is in motion, that valve, Siamese, or adapter shall not project beyond the apparatus running board. The purchaser shall specify if any valve, Siamese, or adapter is to be permanently installed on an intake and identify the brand and model of such item.

The completed apparatus shall have the following intake(s);

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## **2-1/2" INTAKE, STREETSIDE**

There shall be one (1) 2-1/2" (65 mm) gated intake(s) located on pump panel. Each intake shall include:

- One (1) Elkhart Brass Unibody bronze EB series, manual type 2-1/2" (65 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) shall be controlled with a chrome handle directly connected to valve.
- Each intake shall have a 2-1/2" (65 mm) NSTF chrome swivel adapter with strainer provided.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.

## **2-1/2" INTAKE, CURBSIDE**

There shall be one (1) 2-1/2" (65 mm) gated intake(s) located on pump panel. Each intake shall include:

- One (1) Elkhart Brass Unibody bronze EB series, manual type 2-1/2" (65 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) shall be controlled with a chrome handle directly connected to valve.
- Each intake shall have a 2-1/2" (65 mm) NSTF chrome swivel adapter with strainer provided.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.

## **TANK TO PUMP CHECK VALVE**

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

## **TANK TO PUMP VALVE**

A 3" (75 mm) full flow ball valve shall be installed between the fire pump and the water tank. The connection between the tank and the pump shall be capable of the flow recommendations as set forth in the latest edition of NFPA 1901. A non collapsible flexible hose shall be incorporated into the tank to pump plumbing to allow movement in the line as the chassis flexes to avoid damage during normal road operation. The tank to pump valve shall be controlled from the pump operator's panel.

The tank to pump valve shall be as follows;

- Akron valve(s) shall be controlled with a Class 1 air toggle switch located on the pump operator's panel and connected to Class 1 air cylinder to actuate valve(s).
- Two (2) dual position air control switches shall be provided; one (1) in cab console, and one (1) on the pump operator's panel.

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## **DISCHARGES**

A minimum of three (3) 2-1/2 in. (65 mm) outlets shall be provided on any pump rated at 750 gpm (3000 L/min) or greater, and a minimum of one (1) 2-1/2 in. (65 mm) outlet shall be provided on any pump rated at less than 750 gpm (3000 L/min).

The piping and valves supplying any preconnected 1-1/2 in. (38 mm), 1-3/4 in. (45 mm), or 2 in. (52 mm) hose line, including the piping to the preconnected hose storage areas shall be at least 2 in. (52 mm) in size.

All discharge outlet connections, except connections to which a hose will be preconnected, shall be equipped with caps or closures capable of withstanding a hydrostatic gauge pressure of 100 psi (700 kPa) over the maximum pump close-off pressure or 500 psi (3400 kPa), whichever is greater.

Where adapters are provided on the discharge outlet connections, the closures shall fit on the adapters.

Caps or closures for outlet connections smaller than 4 in. (100 mm) shall remain secured to the apparatus when removed from the connection.

Each discharge outlet shall be equipped with a valve that can be opened and closed smoothly at pump discharge gauge pressures of 250 psi (1700 kPa).

The flow-regulating element of each valve shall not change its position under any condition of operation that involves discharge pressures to the maximum pressure of the pump.

The means to prevent a change in position shall be incorporated in the operating mechanism and shall be permitted to be manually or automatically controlled.

Any 3 in. (75 mm) or larger discharge valve shall be a slow-operating valve.

All 1-1/2 in. (38 mm) or larger discharge outlets shall be equipped with a drain or bleeder valve having a minimum 3/4 in. (19 mm) pipe thread connection for draining or bleeding off pressure from a hose connected to the outlet.

Any 2-1/2 in. (65 mm) or larger discharge outlet that is located more than 42 in. (1070 mm) above the ground and to which a hose is to be connected, but that is not in a hose storage area, shall be equipped with a sweep elbow of at least 30 degrees downward.

The completed apparatus shall have the following discharge(s);

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## **FRONT DISCHARGE**

### **2" DISCHARGE**

There shall be one (1) 2" (52 mm) gated discharge(s) with control located on pump panel. Each discharge shall include:

- One (1) of the discharge(s) shall flow water and foam.
- One (1) Elkhart Brass Unibody bronze EB series, actuated type 2" (52 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Elkhart Brass valve(s) shall be configured for 12 VDC electric actuation.
  - An Elkhart Brass UBEC1 electric valve position controller with a 4" diameter aluminum housing and wire harness shall be located on the pump operator's panel. The controller shall have 10 LED ultra-bright display to indicate closed to fully opened status in 10% increments visible in sunlight and automatically dims at night with a preset button that is programmable for any position.
- There shall be a 2" (52 mm) VFC x 1-1/2" (38 mm) NSTM brass or chrome plated 90 degree swivel elbow provided for each discharge.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with red (foam) LED backlighting activated with pump engagement.
  - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
  - Gauge(s) shall have a range from 0 to 400 PSI.
  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.



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## **STREETSIDE DISCHARGE**

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

There shall be two (2) 2-1/2" (65 mm) gated discharge(s) with control located on pump panel. Each discharge shall include:

- Two (2) of the discharge(s) shall flow water only.
- Two (2) Elkhart Brass Unibody bronze EB series, actuated type 2-1/2" (65 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Elkhart Brass valve(s) shall be configured for 12 VDC electric actuation.
  - An Elkhart Brass UBEC1 electric valve position controller with a 4" diameter aluminum housing and wire harness shall be located on the pump operator's panel. The controller shall have 10 LED ultra-bright display to indicate closed to fully opened status in 10% increments visible in sunlight and automatically dims at night with a preset button that is programmable for any position.
- Each discharge shall have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.
  - The specified elbow shall be provided with a 2-1/2" (65 mm) NSTF chrome plated cap with chain.
- Two (2) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- Two (2) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting activated with pump engagement.
  - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
  - Gauge(s) shall have a range from 0 to 400 PSI.
  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

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## **CURBSIDE DISCHARGE**

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

There shall be one (1) 2-1/2" (65 mm) gated discharge(s) with control located on pump panel. Each discharge shall include:

- One (1) of the discharge(s) shall flow water only.
- One (1) Elkhart Brass Unibody bronze EB series, actuated type 2-1/2" (65 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Elkhart Brass valve(s) shall be configured for 12 VDC electric actuation.
  - An Elkhart Brass UBEC1 electric valve position controller with a 4" diameter aluminum housing and wire harness shall be located on the pump operator's panel. The controller shall have 10 LED ultra-bright display to indicate closed to fully opened status in 10% increments visible in sunlight and automatically dims at night with a preset button that is programmable for any position.
- Each discharge shall have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.
  - The specified elbow shall be provided with a 2-1/2" (65 mm) NSTF chrome plated cap with chain.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting activated with pump engagement.
  - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
  - Gauge(s) shall have a range from 0 to 400 PSI.
  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

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## **MISCELLANEOUS DISCHARGE**

### **SHOWER DISCHARGE CURBSIDE**

There shall be one (1) Kingston SKU:BMW4879936, or equal polished chrome adjustable spray brass shower head 1/2" shower discharge with control located on pump panel. Each discharge shall include:

- One (1) Class 1 12BV, manual 1/2" in-line brass ball valve(s) shall be provided. Valve shall be equipped with react angular chromed 1/4 turn control knob to manually open and close the valve(s) with recessed 3" x 1" area for label.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.

### **2" CROSS LAY(S)**

There shall be two (2) 2" cross lay(s) located in pump module, or per the itemized compartment list. The crosslay(s) shall be transverse of the pump module or body with access from either side.

Each cross lay shall have a minimum storage capacity of 200' of 1-3/4" double jacket hose and nozzle.

- Two (2) of the discharge(s) shall flow water and foam.
- Two (2) Elkhart Brass Unibody bronze EB series, actuated type 2" (52 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Elkhart Brass valve(s) shall be configured for 12 VDC electric actuation.
  - An Elkhart Brass UBEC1 electric valve position controller with a 4" diameter aluminum housing and wire harness shall be located on the pump operator's panel. The controller shall have 10 LED ultra-bright display to indicate closed to fully opened status in 10% increments visible in sunlight and automatically dims at night with a preset button that is programmable for any position.
- There shall be a 2" (52 mm) VFC x 1-1/2" (38 mm) NSTM brass or chrome plated 90 degree swivel elbow provided for each discharge.
- Two (2) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- Two (2) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with red (foam) LED backlighting activated with pump engagement.
  - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
  - Gauge(s) shall have a range from 0 to 400 PSI.
  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **2-1/2" CROSS LAY(S)**

There shall be one (1) 2-1/2" cross lay(s) located in pump module, or per the itemized compartment list. The crosslay(s) shall be transverse of the pump module or body with access from either side.

Each cross lay shall have a minimum storage capacity of 200' of 2-1/2" double jacket hose and nozzle.

- One (1) of the discharge(s) shall flow water and foam.
- One (1) Elkhart Brass Unibody bronze EB series, actuated type 2-1/2" (65 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Elkhart Brass valve(s) shall be configured for 12 VDC electric actuation.
  - An Elkhart Brass UBEC1 electric valve position controller with a 4" diameter aluminum housing and wire harness shall be located on the pump operator's panel. The controller shall have 10 LED ultra-bright display to indicate closed to fully opened status in 10% increments visible in sunlight and automatically dims at night with a preset button that is programmable for any position.
- There shall be a 2-1/2" (65 mm) VFC x 2-1/2" (65 mm) NSTM brass or chrome plated 90 degree swivel elbow provided for each discharge.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with red (foam) LED backlighting activated with pump engagement.
  - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
  - Gauge(s) shall have a range from 0 to 400 PSI.
  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **3" DECK GUN DISCHARGE**

There shall be one (1) 3" (75 mm) gated discharge located on the upper deck above the pump compartment. Piping shall rise high enough for a mounted deluge gun to be operated in a 360 degree circle to a lower angle of 15 degrees without being impeded by any part of the apparatus or equipment.

The discharge plumbing shall terminate as required by deck gun model. The discharge shall include:

- One (1) of the discharge(s) shall flow water only.
- One (1) Elkhart Brass Unibody bronze EB series, actuated type 3" (75 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Elkhart Brass valve(s) shall be configured for 12 VDC electric actuation.
  - An Elkhart Brass UBEC1 electric valve position controller with a 4" diameter aluminum housing and wire harness shall be located on the pump operator's panel. The controller shall have 10 LED ultra-bright display to indicate closed to fully opened status in 10% increments visible in sunlight and automatically dims at night with a preset button that is programmable for any position.
- One (1) Innovative Controls model 3003000, ¾" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting activated with pump engagement.
  - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
  - Gauge(s) shall have a range from 0 to 400 PSI.
  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

## **DECK GUN MONITOR**

A TFT Crossfire model XFC-72 portable deck monitor package with 1,250 GPM capacity, deck gun shall be provided with completed unit with following features;

- CROSSFIRE Monitor Top. 2.5" NH
- Quad Stack Tips, MST-4NJ, 2.5" NH
- Stream Straightener, 5" (127 mm)
- Mounting Bracket Set

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## **TELESCOPING WATERWAY - MANUAL**

The specified deck gun shall be mounted on a TFT model XG18VL-PL 18" manually telescopic waterway. For storage, it can be lowered to deck level, or raised to its extended position 18" (45.7 cm) by lifting the quick release and raising by hand until the non-rotating pipe locks into position, while maintaining the ability to horizontally rotate the monitor device 360 degrees. This gives greater clearance of other equipment on the apparatus, greater freedom of movement and allows a more comfortable operating position. The Extend-A-Gun offers a full 3" waterway (3" Victaulic inlet and a 3" male NPT outlet), hardcoat anodized finish, and built-in sensor for connection to "monitor raised" light or truck open compartment warning. The unit shall be covered by a five-year warranty.

XFC-72 with XFT-NJ-2.5, XGB-13 3", Extenda Gun, XF-SS 5" Stream Straightener

## **BOOSTER REEL DISCHARGE**

There shall be one (1) Hannay SBEF series booster hose reel discharge(s) with polished aluminum finish, and electric rewind motor located as required, or per itemized compartment layout.

- Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function.
- Each booster hose reel shall be equipped with a Hannay FH-3 hose guide rollers.
- Each booster reel shall be supplied with 100' x 1" of lightweight 100% polyester booster hose with 1" NST Pyrolite couplings. Hose color shall be red.
- An TFT Quadrafog model DQS60P, 1" grip nozzle shall be provided with specified booster hose reel.
- One (1) of the discharge(s) shall flow water and foam.
- One (1) Elkhart Brass Unibody bronze EB series, actuated type 2" (52 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Elkhart Brass valve(s) shall be configured for 12 VDC electric actuation.
  - An Elkhart Brass UBEC1 electric valve position controller with a 4" diameter aluminum housing and wire harness shall be located on the pump operator's panel. The controller shall have 10 LED ultra-bright display to indicate closed to fully opened status in 10% increments visible in sunlight and automatically dims at night with a preset button that is programmable for any position.
- One (1) Innovative Controls model 3003000, ¾" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with red (foam) LED backlighting activated with pump engagement.
  - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
  - Gauge(s) shall have a range from 0 to 400 PSI.
  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

# Campbell County Fire Department

## Type 3 Engine, SVI #1103-1104

### **TANK FILL VALVE**

There shall be one (1) 2" (52 mm) tank fill valve plumbed with 2" plumbing from the pump to the tank. Installation shall be completed with 2" rubber hose and stainless steel hose couplings. The tank fill valve shall be controlled from the operator's control panel.

- One (1) Elkhart Brass Unibody bronze EB series, manual type 2" (52 mm) valve(s) with stainless steel ball. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.

### **PUMP PANEL**

The side mount pump control panel shall be hinged, or bolted in place allowing it to be easily removed to gain access to plumbing components.

The pump controls shall be mounted on an aluminum control panel with a black powdercoat painted finish.

### **PUMP PANEL LOCATION**

The pump control panel shall be side mounted.

The pump panel shall include the following items;

### **PUMP PANEL ACCESS**

The pump panel shall be open to the side of the truck. The Pump Operator shall NOT be required to open a compartment door to access the pump control panel.

### **ENGINE GAUGES**

The cab/chassis engine gauges shall be provided with the specified pump pressure governor system.

### **PRESSURE GOVERNOR**

The apparatus shall be equipped with the Class 1 Total Pressure Governor Plus (TPG+) connected to the Engine Control Module (ECM) mounted on the engine. The "TPG+" will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's J1939 data for optimal resolution and response when supported by the engine manufacturer. If J-1939 engine control is not supported, then analog remote throttle control shall be provided by the "TPG+". The "TPG+" shall function as a Master Pump Discharge and Intake Gauge with the following features;

- Audible alarm output
- Easy set-up and configuration
- Large, easy to read alpha-numeric display
- Analog engine control of J1939 CAN control for improved resolution and response
- Improved ergonomic tactile feedback button
- Totally integrated instruments including battery voltage, temperature, oil pressure, and RPM
- Integrated engine information reduces required pump panel space
- Programmable presets
- Displays intake and discharge pressure
- Dedicated check engine light and stop engine light

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **MASTER INTAKE/PRESSURE GAUGES**

There shall be one (1) Innovative Controls/NoShok 4" liquid filled gauge to display the Master Intake Pressure, and labeled "PUMP INTAKE".

There shall be one (1) Innovative Controls/NoShok 4" liquid filled gauge to display the Master Discharge Pressure. Gauge shall be labeled "PUMP DISCHARGE".

Both gauges shall have a die cast zinc, chrome plated bezel and color-coded. The left side (Pump Intake) bezel shall be color coded red, and the right side (Pump Discharge) bezel shall be colored black.

A test gauge port manifold shall be integrated into lower center bezel.

- Gauge(s) shall have a white background with black text.
- Gauge(s) shall have a range from -30" to 400 PSI.

## **PUMP SAFETY AND TEST LABELS**

Safety, information, data, and instruction labels for apparatus shall be provided and installed at the operator's instrument panel.

The labels shall include rated capacities, pressure ratings, and engine speeds as determined by the certification tests. The no-load governed speed of the engine, as stated by the engine manufacturer, shall also be included.

The labels shall be provided with all information and be attached to the apparatus prior to delivery.

## **PUMP PANEL LIGHTING**

All gauges and controls on the pump operator's panel shall be adequately illuminated by a full panel width shielded light assembly with full width OnScene Solutions LED light (each panel, if equipped). The light shall be activated by a weather-proof type switch on the pump operator's panel as well as automatically when pump is engaged. This switch shall also activate any area step lighting.

## **PUMP PANEL AIR HORN SWITCH**

The pump operator's panel shall have an Innovative Controls switch panel to activate the cab/chassis air horn(s). Switch shall be constantly illuminated and labeled.

## **POLY WATER TANK**

The water tank capacity shall be approximately 750 US gallon or 624 Imperial gallons. Certification of the tank capacity shall be recorded on the manufacturer's record of construction and shall be provided to the purchaser upon delivery of the apparatus.



# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **CONSTRUCTION**

The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

The water tank shall be of a specific configuration and designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design™. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

## **WATER FILL TOWER AND COVER**

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3™ polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there 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 to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

The tank cover shall be constructed of 1/2" thick PT3™ polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

## **SUMP**

There shall be one (1) sump standard per tank. The sump shall be constructed of a minimum of 1/2" PT3™ polypropylene and be located in the left front quarter of the tank, unless specified otherwise. 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" N.P.T. threaded outlet on the bottom for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

# Campbell County Fire Department

## Type 3 Engine, SVI #1103-1104

### **OUTLETS**

There will be two (2) standard tank outlets: one for the tank-to-pump suction line, which shall be sized to provide adequate water flow to the pump; and, one for tank fill line, which shall be sized according to the NFPA minimum size chart for booster tanks. 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 1000 G.P.M. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through-the-tank sleeves to accommodate rear discharge piping must be specified. All auxiliary outlets and inlets must meet all NFPA guidelines in effect at the time of manufacture.

### **MOUNTING**

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4" x 1" and a Shore A Hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2" x 2" x 1/4" mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4" x 4" x 1/4" by 6" high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3" x 3" x 1/4" and shall be approximately 6" to 12" long. These brackets must incorporate rubber isolating pads with a minimum thickness of 1/4" inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank. Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the Poly-Tank® III for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

### **CENTER OF GRAVITY**

A center of gravity calculation shall be determined for each tank and provided as requested in order to provide the apparatus manufacturer with the necessary data to design and certify the apparatus with respect to the NFPA requirements regarding rollover stability.

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Type 3 Engine, SVI #1103-1104

## **WATER TANK LEVEL GAUGE**

There shall be one (1) Fire Research TankVision Pro model WLA300-A00 tank indicator level gauge provided and installed. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

## **CAB MOUNTED WATER TANK INDICATOR**

There shall be one (1) Fire Research TankVision model WLA205-A00 miniature tank indicator provided and installed in cab. The indicator shall show the volume of water in the tank on five (5) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be manufactured of aluminum and have a distinctive blue label.

The miniature indicator shall receive input information over a single wire from a Fire Research TankVision model WLA200-A00, WLA300-A00 or WLA400-A00.

## **UPF POLY WATER TANK WARRANTY**

The UPF poly water tank shall be provided with a lifetime material and workmanship limited warranty. The manufacturer shall supply details of their warranty information with their bid submission.

## **FILL TOWER PROTECTION**

The fill tower(s) shall be boxed in with an aluminum panel for protection from damage.

## **CLASS A POLYPROPYLENE FOAM CELL**

There shall be one (1) 30 US gallon or 24.6 Imperial gallons polypropylene foam cell incorporated into the polypropylene water tank. This foam tank capacity shall be deducted from water tank size specified.

There shall be one (1) pressure/vacuum vent installed on the foam tank.

A minimum 1 in. (25 mm) inside diameter full flow drain valve and piping shall be provided at the lowest point of any foam concentrate tank. The drain shall be piped to drain directly to the surface beneath the apparatus without contacting other body or chassis components.

A label shall be affixed to the foam tank fill indicating: "WARNING" Class A foam tank fill, do not mix brands or types of foam.

# Campbell County Fire Department

Type 3 Engine, SVI #1103-1104

## **FOAM TANK LEVEL GAUGE, CLASS A**

There shall be one (1) Fire Research TankVision Pro model WLA360-A00 tank level gauge provided and installed. The kit shall include an electronic indicator module, a pressure sensor, a 10' sensor cable and a tank vent. The indicator shall show the volume of Class A foam concentrate in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive green label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the foam tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

## **HOSE BED STORAGE AREA**

Hose bed storage area shall be located over water tank and body, and shall exit at the rear of the apparatus. The interior of storage area shall be free from all projections such as nuts, sharp angles, or brackets that may damage equipment.

## **ALUMINUM HOSE BED DECKING**

The hose bed deck shall be constructed from 3" x 3/4" hollow aluminum extrusions welded into a one-piece grid to allow ventilation and water drainage. The extrusions shall have a radiused ribbed top surface. The deck will be completely removable for easy access to the booster tank. The booster tank fill tower shall be protected as necessary to prevent damage from equipment located in the storage area.

## **WALKWAY/STEP LIGHTS**

There shall be four (4) Round Recessed LED lights provided to illuminate the hosebed area when covers are open. The lights shall be activated when the parking brake is set.

Each light shall be mounted in a rubber gasket style housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

## **HOSE BED STORAGE**

The following fire hose shall be stored in hose bed storage area;

- Thirteen (13) The apparatus hose bed shall be capable of holding:
  - 600' of 2 1/2" Double Jacket on the Street Side hose bed.
  - 600' of 3" Double Jacket on the Curb Side hose bed.

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## **HOSE BED DIVIDER(S)**

One (1) adjustable aluminum hose bed divider(s) shall be provided in the hose bed storage area. The dividers(s) shall be fabricated from 3/16" smooth aluminum with 1" round split aluminum tubing welded to the top and rear edges. A radiused hand-hold opening shall be provided on rear of divider to assist in access to hose bed area. Hose pay-out shall be unobstructed by the divider.

## **ALUMINUM HOSE BED COVER**

A two-section hose bed cover shall be provided. Each door shall be fabricated from 1/8" NFPA aluminum treadplate with formed hat sections for bracing. Doors shall be hinged along each side of the hose body using stainless steel piano hinge. The top surface of each section shall slant down with the highest point in the center of the hose bed area and shall be supported from underneath by at least one (1) adjustable hose bed divider. Each section shall be constructed to support the weight of a 300 lb. person.

A flashing warning light signal shall be provided indicating when a hose bed door is not in a closed position as required by NFPA 1901.

There shall be one (1) 24" vertical handrail on each door to assist in raising and lowering hose bed door. Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

Each door shall have a 36" OnScene LED light on the underside of the door that will be automatically activated when the door is opened.

A cargo netting style hose bed flap shall be provided with yellow pulls with reflective bungee attached to each door and extend downward to bottom of hose bed to protect hose and equipment from weather and dust. The center where both doors come together shall have a Velcro seam to join two-pieces of vinyl together.

## **AIR ASSIST**

Each hose bed door shall have a single air actuator located in the front of hose bed utilized to open and close the hose bed doors.

A switch shall be located at the rear of the unit in a convenient location allowing the operator to view the hose bed doors while operating. The switch shall be interlocked with the parking brake and is only operable when the parking brake is applied. The doors are connected to the open door warning system when in the open condition. An audible alarm is located towards the front of the hosebed area designed to warn possible occupants of the hosebed area that door movement is occurring. The switch location shall be located no more than 72" off the ground level.

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## **EQUIPMENT MOUNTING ALLOWANCE**

An equipment mounting allowance of \$2,000.00 shall be provided.

## **EQUIPMENT PAYLOAD WEIGHT ALLOWANCE**

In compliance with NFPA 1901 standards, the pumper shall be designed for an equipment loading allowance of 2,000 lbs. of Campbell County Fire Department provided equipment based on the body having less than 250 cu. ft. of storage space.

## **EQUIPMENT**

The following equipment shall be furnished with the completed pumper vehicle;

- One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.
- There shall be two (2) Zico SAC-44-E NFPA approved folding aluminum wheel chocks provided for 44" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20 % grade, with the transmission in neutral, and the parking brake released.
  - The wheel chock(s) shall be mounted behind rear wheels, below body on streetside.
- One (1) Duo-Safety 900-A series 24' 2-section extension ladder(s) shall be provided with the completed unit.
  - The ladder(s) shall be mounted on specified ladder rack.
- One (1) Duo-Safety 775A series 14' aluminum roof ladder(s) shall be provided with the completed unit.
  - The ladder(s) shall be mounted on specified ladder rack.
- One (1) Duo-Safety 585-A 10' aluminum folding ladder(s) shall be provided with the completed unit.
  - The ladder(s) shall be mounted on specified ladder rack.
- One (1) Fire Hooks Unlimited RH-6 hook(s) shall be provided with the completed unit.
  - The above specified pike pole will not have a D handle attached
  - The pike pole(s) shall be mounted on the specified ladder rack.
- One (1) Fire Hooks Unlimited RH-8 hook(s) shall be provided with the completed unit.
  - The above specified pike pole will not have a D handle attached
  - The pike pole(s) shall be mounted on the specified ladder rack.
- One (1) 20 lb. ABC dry chemical aluminum fire extinguisher(s) shall be provided with the completed unit.
  - The above specified fire extinguisher(s) shall be installed on the completed unit, location to be determined by the Campbell County Fire Department.

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- One (1) 2-1/2 gallon pressurized water (Class A) fire extinguisher(s) shall be provided with the completed unit.
  - The above specified fire extinguisher(s) shall be installed on the completed unit, location to be determined by the Campbell County Fire Department.
- Two (2) Streamlight FireBox LED flashlight(s) with shoulder strap shall be provided be provided with 540/330 lumen output and 7/15 hour run time.. Each flashlight shall be orange in color and have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have a LED E-Spot spotlight style bulbs and reflectors with 2 ultra-bright LED taillights. The flashlight(s) shall be wired to battery direct unless otherwise specified by Campbell County Fire Department.
- Two (2) flashlight(s) shall be mounted in cab on the rear side wall next to the forward facing seating position.
- One (1) Akron Brass Revel Scout ELRE-SCOUT-1B light(s) shall be provided, location Campbell County Fire Department.
  - The floodlight(s) shall be mounted on the completed unit, locations as per the Campbell County Fire Department.
- One (1) Honda model EU2200ITA portable generator shall be provided with completed appataus.
- Two (2) Kocheck 6.0" x 10' Flexlite PVC flexible suction hose(s) shall be provided with completed unit. The hose shall have light weight NH, 2-lug couplings provided.
- One (1) 6" barrel strainer(s) with foot valve shall be provided with completed unit. Barrell strainer hard suction end shall match provided hard suction(s).
  - The suction hose(s) shall be mounted on the specified ladder rack.
- Campbell County Fire Department supplied NFPA required fire hose and nozzles shall be provided on completed unit before placing vehicle in service.

### **REMAINING NFPA MINOR EQUIPMENT BY PURCHASER**

All other minor equipment not specified above, but required by NFPA 1901 for pumpers, section 5.9.4 shall be supplied and mounted by Campbell County Fire Department before the unit is placed in emergency service.