FAIR ETHICAL & LEGAL COMPETITION

In order to ensure fair, ethical, and legal competition, neither original equipment manufacturer (OEM) nor parent company of the OEM shall have ever been fined or convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

There will be no exceptions.

MATERIAL & WORKMANSHIP

All equipment furnished shall be guaranteed to be new and of current manufacture, to meet all requirements of these specifications.

All workmanship shall be of high quality and accomplished in a professional manner so as to insure a functional apparatus with a pleasing, aesthetic appearance.

CONTRACT ADMINISTRATOR

The successful bidder shall designate a contract administrator to provide a single point interface between the purchaser and the contractor on all matters concerning the contract.

APPROVAL DRAWING

A detailed drawing of the apparatus shall be provided to the purchaser for approval before construction begins. A copy of this drawing shall also be provided to the manufacturer's representative. Upon purchaser's approval, the finalized drawing shall become a part of the total contract.

The drawing shall show, but is not limited to, such items as the chassis make and model, major components, location of lights, sirens, all compartment locations and dimensions, special suctions, discharges, etc. The drawing shall be a visual interpretation of the apparatus as it is to be supplied.

DELIVERY

Delivery of the apparatus to the customer shall remain the bidder's responsibility.

On initial delivery of the fire apparatus, a qualified and responsible representative of the contractor shall demonstrate the apparatus and provide initial instruction to representatives of the customer regarding the operation, care, and maintenance of the apparatus and equipment supplied.

*Options listed on pg. 82

VEHICLE FLUID PLATE

As required by NFPA-1901, the contractor shall affix a permanent plate in the driver's compartment specifying the quantity and type of the following fluids used in the vehicle:

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

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump primer fluid
- Drive axle(s) lubrication fluid
- Air-conditioning refrigerant
- Air-conditioning lubrication oil
- Power steering fluid
- Cab tilt mechanism
- Transfer case fluid
- Equipment rack fluid
- Air compressor system lubricant
- Generator system lubricant
- Aerial systems

EXACT BLUEPRINT WITH BID

A scale drawing of the specific apparatus being proposed shall be submitted WITH THE BID. Drawings of similar units or demo units shall not be permitted.

Bidders should be clear that this provision is requiring a SCALE drawing of the truck which is actually being bid.

The drawing shall be done at the manufacturer's facility by the manufacturer's engineering department in order to guarantee the accuracy of the drawing.

MANUFACTURED IN UNITED STATES

The entire apparatus shall be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service.

AMP DRAW REPORT

The bidder shall provide with their bid proposal and at the time of delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

A written load analysis, which shall include the following:

- The rating of the alternator.
- The minimum continuous load of each component that is specified per: Applicable NFPA-1901.
- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

All of the above listed items shall be provided by the bidder per the applicable NFPA-1901.

COOPERATIVE PURCHASING

The Manufacturer shall be pleased to allow other public agencies to use the purchase agreement resulting from this invitation to bid unless the bidder expressly notes on the proposal form that prices are not available for tag-on.

The condition of such use by other agencies shall be that any such agency must make and pursue contact, purchase order/contract, and all contractual remedies with the successful bidder.

Such tag-ons shall be done so that the original purchasing agency has no responsibility for performance by either the manufacturer or the agency using the contract.

PRODUCTION LEVEL ELECTRICAL DRAWINGS

Bidder shall provide production level harness drawings for the specific unit to be built.

COMPLETION INFORMATION

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

- Owners name and address
- Apparatus manufacturer, model and serial number
- Chassis make, model and serial number
- Front tire size and total rated capacity in pounds
- Rear tire size and total rated capacity in pounds
- Chassis weight distribution in lbs with water and manufacturer mounted equipment, front and rear
- Engine make, model, serial number, rated horsepower, rated speed and governed speed
- Type of fuels and fuel tank capacity
- Electrical system voltage and alternator output in amps.
- Battery make, model and total capacity in cold crank amps (CCA)
- Transmission make, model, and serial number. If so equipped chassis transmission PTO(s) make, model and gear ratio
- Pump make, model, rated capacity in gallons per minute (liters per minute where applicable) and serial number

- Pump transmission make, model, serial number and gear ratio
- Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable) and serial number
- Water tank certified capacity in gallons or liters
- Paint manufacturer and paint number(s)
- Company name and signature of responsible company representative
- Certification of slip resistance of all stepping, standing and walking surfaces.

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturer's certification of suction capability.

If the apparatus has a fire pump or an industrial supply pump, a copy of the apparatus manufacturer's approval for stationary pumping applications.

If the apparatus has a fire pump or an industrial supply pump, the engine manufacturers certified brake horsepower curve for the engine furnished, showing the maximum governed speed.

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturers certification of hydrostatic test.

If the apparatus has a fire pump or an industrial supply pump, the third party certification of inspection and test for the fire pump (if applicable).

If the apparatus has an aerial device the third party certification of inspection and test for the aerial device.

If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911, Standards for Testing Fire Department Aerial Devices.

If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source (if applicable).

Weight documents from certified scale - showing actual loading on the front axle, rear axle(s) and overall vehicle (with the water tank full but without personnel, equipment and hose) shall be supplied with the complete vehicle to determine compliance with NFPA-1901.

Written load analysis and results of electrical performance tests.

If the apparatus is equipped with a water tank, the certification of water tank capacity by the tank manufacturer.

FMVSS REQUIREMENT

The chassis shall be certified by the apparatus manufacturer as conforming to all applicable Federal Motor Vehicle Safety Standards in effect at the date of contract.

This shall be attested to by the attachment of a FMVSS certification label on the vehicle by the contractor who shall be recognized as the responsible final manufacturer.

RECORDS

The successful bidder shall be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the apparatus.

These records shall be maintained in the factory of the bidder for a minimum of twenty (20) years.

File shall contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents.

The Newcastle Fire Department shall have access to any and all documents contained in this file upon official written request.

GENERAL CONSTRUCTION

The complete apparatus, assemblies, subassemblies, component parts, etc., shall be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subject.

All parts of the apparatus shall be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in fire fighting service.

All parts of the apparatus shall be strong enough to withstand general service under full load.

The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

Bidder's specifications must meet minimum requirements of N.F.P.A. Pamphlet #1901 and all State and Federal Department of Transportation vehicle regulations at time of sale.

The apparatus shall be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between front and rear axles that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters shall be carried without overloading or injuring the apparatus.

PRODUCT LIABILITY

Each bidder shall supply proof of product liability and facility insurance equal to or exceeding $30,000,000.00. This shall be provided as part of the proposal. There will be no exceptions.

PAINT CERTIFICATION

The finish paint shall be certified by the apparatus manufacturer as conforming to all applicable Commercial Vehicle Paint Standards in effect at the date of contract.

This shall be attested to by the attachment of a Sikkens certification.

WARRANTY, STARTING ON DELIVERY DATE

Warranty coverage will begin on the date of delivery to the customer.

PRICES & PAYMENTS

The bid price will be F.O.B. Destination, on a delivered and accepted basis at the Fire Department. Total price on the proposal sheet will include all items listed in these specifications. It is understood that any applicable taxes will be added to the proposed prices, unless the purchaser furnishes appropriate tax-exempt forms.

INSTRUCTION MANUALS - TWO (2) SETS

In accordance with standard commercial practices, applicable to each vehicle (including body and special equipment) furnished under the contract, the following listed manuals and schematics, in the quantity specified, shall be provided at time of delivery of each vehicle.

The contractor shall supply at time of delivery, (2) three ring binder and (2) USB copies of a complete operation and service manual covering the complete apparatus as delivered and accepted.

The manual shall contain the following:

- Descriptions, specifications, and ratings of chassis, pump (if applicable), and aerial device
- Wiring diagrams
- Lubrication charts
- Operating instructions for the chassis, any major components such as a pump and any auxiliary systems
- Instructions regarding the frequency and procedures recommended for maintenance
- Parts replacement information

!!! CRITICAL OVERALL HEIGHT REQUIREMENT !!! - "YES" - 114" MAX HEIGHT

This vehicle has a critical overall height restriction requirement due to fire station door height or obstruction within the fire department/district.

Maximum overall height of vehicle in the unloaded configuration cannot exceed: 114" (inches).

NFPA TREADPLATE CERTIFICATION

All stepping, standing, and walking surfaces on the body shall meet NFPA #1901 anti-slip standards.

Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be NFPA embossed compliant.

Upon request by the purchaser, the manufacturer shall supply proof of compliance with this requirement.

VERTICAL TREAD PLATE - NON-EMBOSSED

The following vertical surfaces on the vehicle (if applicable) shall have non-embossed tread plate:

To include but not limited to:

- Rear of cab overlay
- Rear body overlay
- Front of body overlay
- Front pump house panel

- Custom cab step well
- Fender overlay
- Fender compartment doors
- Interior cab trim
- Upper body walkway walls
- Rescue body interior (walk-In/walk through)

"PUMPER FIRE APPARATUS" NFPA 2016 CHAPTERS

The unit shall be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2016 Revision), which shall include the following required chapters as stated in this revision:

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 5 Pumper Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices
- Chapter 14 Driving and Crew Areas
- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 16 Fire Pumps and Associated Equipment
- Chapter 18 Water Tanks

NFPA "CHAPTER 20" FOAM SYSTEM REQUIREMENTS

Chapter 20 Foam Proportioning Systems

NFPA "CHAPTER 22" 110 VOLT SYSTEM REQUIREMENTS

Chapter 22 Line Voltage Electrical Systems

SAFETY SIGNS (NFPA REQUIRED)

Safety sign(s) shall be located on the vehicle at the rear step, and at any cross walkway(s), to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

THIRD PARTY TESTING

If required by the specific chapters of NFPA-1901, the proposed unit shall be tested and certified by independent third party inspectors.

All test work for fire pumps outlined in NFPA 1901, Edition shall be conducted.

The third party inspectors shall provide the manufacturer a complete written examination and test report for each inspection performed at the manufacturer's facility.

This report specifies the points of inspection and results of such examinations and tests.

The inspectors performing the test work on the units are certified to Level II in the required NDT methods, under the requirements outlined in ASNT document CP-189.

The actual person(s) performing the inspection shall present for review proof of Level II Certification in the required NDT methods.

The apparatus manufacturer shall designate, in writing, who is qualified to witness and certify these test results.

Prior to submission to the automotive fire apparatus manufacturer, the final Report shall be reviewed by the Supervisor of Fire Equipment Services and a Registered Professional Engineer.

When the unit successfully meets all the requirements outlined in NFPA 1901, current edition, the third party inspector shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with NFPA- 1901.

120/240 VOLT ELECTRICAL SYSTEM TESTING

All line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test shall be conducted between live parts and the neutral conductor and between live parts and the vehicle frame with any switches in the circuits closed. The test shall be conducted after all bodywork has been completed. The dielectric tester shall have a minimum 500 VA transformer with a sinusoidal output voltage that can be verified.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

The generator shall be started from a cold start condition and the line voltage electrical system shall be loaded to 100 percent of the nameplate voltage rating.

The following items shall be monitored and documented every 15 minutes:

- The cranking time until the generator starts and runs.
- The voltage, frequency, and amperes at continuous full rated load.
- The generator oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery rate charge, as applicable.
- The ambient temperature and altitude.

The generator shall operate at 100 percent of its nameplate wattage for a minimum of two (2) hours.

UL LINE VOLTAGE TESTING

When the unit successfully meets all the requirements outlined in NFPA 1901, 2016 Edition, third party inspectors shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with the required line voltage section of NFPA.

CENTER CONSOLE - BRUSHED (Commercial Chassis)

A center console fabricated from 1/8" aluminum or stainless steel shall be provided and mounted between the driver and officer's seats. The console shall be designed with a brush pewter upper and lower panel. The upper panel shall be the mounting surface for optional switches (all emergency switches will utilize switching provided in the chassis dash), applicable indicator lights and electronic siren control boxes. The lower panel shall be used for mounting applicable radios, joysticks, pump controls, etc. all controls will be within reach of the driver or officer.

In addition, the console shall be equipped with two (2) map/notebook storage pockets at the rear of the console. The console dimensions are based on the available space in the cab.

A Blue Sea model #4363 multi-use power point with built in two (2) USB ports, and one (1) 12-volt socket shall be installed on the console.

A Blue Sea model #5032 split 12 space fuse block shall be installed in the center console. Side "A" shall be battery power and side "B" shall be battery disconnect. The fuse block shall be limited to 60 amps per load group and 30 amps per circuit with a total amperage capacity of 100 amps.

The console will have a brushed finish.

Commercial Chassis 4DR 4X2 16/30 INTERNATIONAL OR FREIGHTLINER

SBA 121.00 CA, and 75.00 Axle to Frame.
AXLE CONFIGURATION 4x2
FRAME RAILS Heat Treated Alloy Steel (120,000 PSI Yield); 10.125" x 3.580" x 0.312" 480.0" Maximum
OAL FRAME REINFORCEMENT Full Outer C-Channel, Heat Treated Alloy Steel (120,000 PSI Yield), 480.0"
OAL FRAME DIMPLE Dimple on Left and Right Top Flange of Frame Rail to Reference Rear Axle Centerline
FRAME EXTENSION, FRONT Integral; 20" In Front of Grille, with Outer C-Channel Reinforcement
WHEELBASE RANGE 189" (480cm) Through and Including 256" (650cm)
AXLE, FRONT NON-DRIVING Wide Track, I-Beam Type, 16,000-lb Capacity
SUSPENSION, FRONT, SPRING Parabolic Taper Leaf, Shackle Type, 16,000-lb Capacity, with Shock Absorbers
BRAKE SYSTEM, AIR Dual System for Straight Truck Applications
Includes
: BRAKE LINES Color and Size Coded Nylon
: DRAIN VALVE Twist-Type
: GAUGE, AIR PRESSURE (2) Air 1 and Air 2 Gauges; Located in Instrument Cluster
: PARKING BRAKE CONTROL Yellow Knob, Located on Instrument Panel
: PARKING BRAKE VALVE For Truck
: QUICK RELEASE VALVE On Rear Axle for Spring Brake Release: 1 for 4x2, 2 for 6x4
: SPRING BRAKE MODULATOR VALVE R-7 for 4x2, SR-7 with relay valve for 6x4/8x6
DRAIN VALVE {Bendix DV-2} Automatic, with Heater, for Air Tank
AIR BRAKE ABS {Bendix AntiLock Brake System} 4-Channel (4 Sensor/4 Modulator) Full Vehicle Wheel Control System
AIR DRYER {Bendix AD-IP} with Heater

BRAKE CHAMBERS, REAR AXLE {Bendix EverSure} 36/36 SqIn Spring Brake
BRAKE CHAMBERS, FRONT AXLE {Bendix} 24 SqIn
BRAKE, PARKING Manual Push-Pull Pneumatic Parking Brake
SLACK ADJUSTERS, FRONT {Haldex} Automatic
SLACK ADJUSTERS, REAR {Haldex} Automatic
AIR COMPRESSOR {Cummins} 18.7 CFM
AIR TANK LOCATION (2) Mounted Left Side BOC Under Battery Box
AIR DRYER LOCATION Mounted Inside Left Rail, Back of Cab
DUST SHIELDS, FRONT BRAKE for Air Cam Brakes
DUST SHIELDS, REAR BRAKE for Air Cam Brakes
BRAKES, REAR {Meritor 16.5X7 P} Air S-Cam Type, Cast Spider, Cast Shoe, Double Anchor Pin, Includes Greaseable and Zinc Coated Anchor Pins, Size 16.5" X 7", 38,000-lb Capacity per Axle BRAKES, FRONT {Meritor 16.5X6 Q-PLUS CAST} Air S-Cam Type, Cast Spider, Fabricated Shoe, Double Anchor Pin, Size 16.5" X 6", 23,000-lb Capacity
STEERING COLUMN Tilting and Telescoping
STEERING WHEEL 4-Spoke; 18" Dia., Black
STEERING GEAR {Sheppard M110} Power
DRIVELINE SYSTEM {Dana Spicer} SPL170, for 4x2/6x2
AFTERTREATMENT COVER Steel, Black
EXHAUST SYSTEM Horizontal Aftertreatment System, Frame Mounted Right Side Under Cab, for Single Short Horizontal Tail Pipe, Frame Mounted Right Side Back of Cab
ENGINE COMPRESSION BRAKE {Jacobs} for Cummins ISL/L9 Engines; with Selector Switch and On/Off Switch
SWITCH, FOR EXHAUST 3 Position, Momentary, Lighted Momentary,
ON/CANCEL, Center Stable,
INHIBIT REGEN, Mounted in IP Inhibits Diesel Particulate Filter Regeneration When Switch is Moved to ON While Engine is Running, Resets When Ignition is Turned OFF
ELECTRICAL SYSTEM 12-Volt, Standard Equipment
Includes
: DATA LINK CONNECTOR For Vehicle Programming and Diagnostics In Cab
: HAZARD SWITCH Push On/Push Off, Located on Instrument Panel to Right of Steering Wheel
: HEADLIGHT DIMMER SWITCH Integral with Turn Signal Lever
: PARKING LIGHT Integral with Front Turn Signal and Rear Tail Light
: STARTER SWITCH Electric, Key Operated
: STOP, TURN, TAIL B/U LIGHTS Dual, Rear, Combination with Reflector
: TURN SIGNAL SWITCH Self-Cancelling for Trucks, Manual Canceling for Tractors, with Lane Change Feature
: WINDSHIELD WIPER SWITCH 2-Speed with Wash and Intermittent Feature (5 Pre-Set Delays), Integral with Turn Signal Lever
: WINDSHIELD WIPERS Single Motor, Electric, Cowl Mounted
: WIRING, CHASSIS Color Coded and Continuously Numbered
HORN, ELECTRIC (2) Disc Style
FOG LIGHTS Prewire; Includes Auxiliary Switch and Wiring to Front Bumper, for Driving Lights or Fog Lights Mounted by Customer
IGNITION SWITCH Keyless
POWER SOURCE Cigar Type Receptacle without Plug and Cord

ALTERNATOR Brushless, 12 Volt, 325 Amp Capacity, Pad Mount, with Remote Sense
BODY BUILDER WIRING Rear of Frame; Includes Sealed Connectors for Tail/Amber Turn/Marker/ Backup/Accessory Power/Ground and Sealed Connector for Stop/Turn
BATTERY SYSTEM Maintenance-Free, (3) 12-Volt 1980CCA Total, Top Threaded Stud TAIL LIGHT WIRING MODIFIED Includes: Wiring for Standard Lt & Rt Tail Lights; Separate 8.0' of Extra Cable Wiring for Lt Rt Body Mounted Tail Lights
2-WAY RADIO Wiring Effects; Wiring with 20 Amp Fuse Protection, Includes Ignition Wire with 5 Amp Fuse, Wire Ends Heat Shrink and 10' Coil Taped to Base Harness
SPEAKERS (2) 6.5" Dual Cone Mounted in Both Doors, (2) 5.25" Dual Cone Mounted in Both B-Pillars
ANTENNA Shark Fin, Roof Mounted
RADIO AM/FM/WB/Clock/Bluetooth/USB Input/Auxiliary Input
BACK-UP ALARM Electric, 102 dBA
DATA RECORDER Includes Display Mounted in Overhead Console
STOP-LIGHT WIRING MODIFIED Stop-Lights Turned on When Engine Compression Brake, Exhaust Brake or Retarder is Activated
BATTERY BOX Steel, with Plastic Cover, 30" Wide, 2-4 Battery Capacity, Mounted Left Side Back of Fuel Tank
SOLENOID, AIR for Customer Use; Provides (2) Normally Closed Pilot Air Source, Approx. 4 CFM, Includes Latched Switch in Cab; Air Available Only with Key in "Ignition" or "Accessory" Position; Air Will Exhaust with Key in "Off" Position
CLEARANCE/MARKER LIGHTS (5) Amber LED Lights, Flush Mounted on Cab or Sunshade
TEST EXTERIOR LIGHTS Pre-Trip Inspection will Cycle all Exterior Lamps Except Back-up Lights
STARTING MOTOR 12 Volt, Less Thermal Over-Crank Protection
INDICATOR, LOW COOLANT LEVEL with Audible Alarm
INDICATOR, BATTERY WARNING Green
BATTERY ON Indicator, Mounted on Left Side of Instrument Panel, To be Used with Factory Installed or Customer Mounted Battery Disconnect Switch
CIRCUIT BREAKERS Manual-Reset (Main Panel) SAE Type III with Trip Indicators, Replaces All Fuses
TURN SIGNALS, FRONT Includes LED Side Turn Lights Mounted on Fender
HORN, AIR Single Trumpet, Black, with Lanyard Pull Cord
BATTERY DISCONNECT SWITCH for Cab Power Disconnect Switch, Disconnects Power to Power Distribution Center (PDC) and Body Builder Through Solenoid, Does Not Disconnect Charging Circuits, Locks with Padlock, Cab Mounted
HEADLIGHTS Halogen, with Daytime Running Lights, Automatic Twilight Controlled
STEERING WHEEL CONTROLS Customizable Switch Pod
POWER SOURCE, ADDITIONAL Auxiliary Power Outlet (APO) with USB-A Port and USB-C Port, Located in the Instrument Panel
FENDER EXTENSIONS
LOGOS EXTERIOR Model Badges, Shipped Loose, Located in Cab
LOGOS EXTERIOR, ENGINE Badge Shipped Loose
INSULATION, UNDER HOOD for Sound Abatement
GRILLE Stationary, Chrome
INSULATION, SPLASH PANELS for Sound Abatement
FRONT END Tilting, Fiberglass, with Three Piece Construction, for WorkStar/HV GRILLE EMBER SCREEN Mounted to Grille and Cowl Tray to Keep Hot Embers out of Engine and HVAC Air Intake System

PAINT IDENTITY, PT-2 Single Color, Instruction No. 932. Wheels
PAINT TYPE Base Coat/Clear Coat, 1-2 Tone
PAINT CLASS Single Custom Color
COMMUNICATIONS MODULE Telematics Device with Over the Air Programming;
PROMOTIONAL PACKAGE Government Silver Package
VEHICLE REGISTRATION IDENTITY ID for Other State
Notes : CANNOT BE REGISTERED IN CALIFORNIA AND OREGON. For vehicles that will be registered in States other than California and Oregon.
KEYS - ALL ALIKE, ID I-1003 Compatible with Z-001
CLUTCH Omit Item (Clutch Control)
ANTI-FREEZE Red, Extended Life Coolant; To -40 Degrees F/ -40 Degrees C, Freeze Protection
BLOCK HEATER, ENGINE 120V/1000W, for Cummins ISB/B6.7/ISL/L9 Engines Includes
: BLOCK HEATER SOCKET Receptacle Type; Mounted below Drivers Door
ENGINE, DIESEL {Cummins L9 450} EPA 2024, 450HP @ 2100 RPM, 1250 lb-ft Torque @ 1200 RPM, 2100 RPM Governed Speed, 450 Peak HP (Max), (RATED FOR EMERGENCY VEHICLES ONLY)
FAN DRIVE {Horton Drivemaster} Two-Speed Type, Direct Drive, with Residual Torque Device for Disengaged Fan Speed
Includes
: FAN Nylon
RADIATOR Aluminum, Cross Flow, Front to Back System, 1469 SqIn, with 1172 SqIn Charge Air Cooler Includes
: DEAERATION SYSTEM with Surge Tank
: HOSE CLAMPS, RADIATOR HOSES Gates Shrink Band Type; Thermoplastic Coolant Hose Clamps
: RADIATOR HOSES Premium, Rubber
AIR CLEANER Dual Element
EMISSION, CALENDAR YEAR {Cummins L9} EPA, OBD and GHG Certified for Calendar Year 2024
THROTTLE, HAND CONTROL Engine Speed Control; Electronic, Stationary, Variable Speed; Mounted on Steering Wheel
EPA IDLE COMPLIANCE Low NOx Idle Engine, Complies with EPA Clean Air Regulations; Includes "Certified Clean Idle" Decal on Hood
ENGINE WATER COOLER {Sen-Dure} Auxiliary, For Use with Fire Trucks
CARB IDLE COMPLIANCE Does Not Comply with California Clean Air Idle Regulations
CARB EMISSION WARR COMPLIANCE for Cummins L9 Engines
ENGINE CONTROL, REMOTE MOUNTED Provision for; Includes Wiring for Body Builder Installation of PTO Controls and Starter Lockout, with Ignition Switch Control, for Cummins B6.7 and L9 Engines
TRANSMISSION, AUTOMATIC {Allison 3000 EVS} 6th Generation Controls, Close Ratio, 5-Speed with Overdrive, with PTO Provision, Less Retarder, Includes Oil Level Sensor, Max, GVW N/A
OIL COOLER, TRANSMISSION {Modine} Water to Oil Type
TRANSMISSION SHIFT CONTROL Column Mounted Stalk Shifter, Not for Use with Allison 1000 2000 Series Transmission
TRANSMISSION OIL Synthetic; 29 thru 42 Pints
ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS), Fire/Pumper, Tank, Aerial/Ladder, Package Number 198, Includes J1939 Based Auto Neutral
SHIFT CONTROL PARAMETERS {Allison} 3000 or 4000 Series Transmissions, Performance Programming
PTO LOCATION Dual, Customer Intends to Install PTO at Left and/or Right Side of Transmission

AXLE, REAR, SINGLE {Meritor RS-30-185} Single Reduction, 30,000-lb Capacity, T Wheel Ends . Gear Ratio: 5.13
SUSPENSION, REAR, SINGLE 31,000-lb Capacity, Vari-Rate Springs, with 4500-lb Capacity Auxiliary Rubber Springs
SHOCK ABSORBERS, REAR (2)
FUEL/WATER SEPARATOR {Racor 400 Series} with Primer Pump, Includes Water-in-Fuel Sensor, Mounted on Engine
FUEL TANK Top Draw, Non-Polished Aluminum, D-Style, 19" Tank Depth, 50 US Gal (189L), Mounted Left Side, Under Cab
FUEL COOLER Less Thermostat; Mounted in Front of Cooling Module
DEF TANK 7 US Gal (26L) Capacity, Frame Mounted Outside Left Rail, Under Cab CAB Conventional 6-Man Crew Cab
AIR CONDITIONER with Integral Heater and Defroster
GAUGE CLUSTER Base Level; English with English Electronic Speedometer
Includes

: GAUGE CLUSTER DISPLAY: Base Level (3" Monochromatic Display), Premium Level (5" LCD Color Display); Odometer, Voltmeter, Diagnostic Messages, Gear Indicator, Trip Odometer, Total Engine Hours, Trip Hours, MPG, Distance to Empty/Refill for

: GAUGE CLUSTER Speedometer, Tachometer, Engine Coolant Temp, Fuel Gauge, DEF Gauge, Oil Pressure Gauge, Primary and Secondary Air Pressure

: WARNING SYSTEM Low Fuel, Low DEF, Low Oil Pressure, High Engine Coolant Temp, Low Battery Voltage (Visual and Audible), Low Air Pressure (Primary and Secondary)

GRAB HANDLE, CAB INTERIOR (4) Safety Yellow, Crew Cab
SEATBELT WARNING PREWIRE Includes Seat Belt Switches and Seat Sensors for all Belted Positions in the Cab and a Harness Routed to the Center of the Dash for the Aftermarket Installation of the Data Recorder and Seatbelt Indicator Systems, for 4 to 6 Seat Belts
GAUGE, OIL TEMP, AUTO TRANS for Allison Transmission
GAUGE, AIR CLEANER RESTRICTION {Filter-Minder}
Mounted in Instrument Panel IP CLUSTER DISPLAY On Board Diagnostics Display of Fault Codes in Gauge Cluster
SEAT, DRIVER {H.O. Bostrom Sierra Air 100} NFPA Compliant, Air Suspension, High Back, Vinyl with Covered Back for Fire Truck
SEAT, PASSENGER {H.O. Bostrom Tanker 450} for SCBA; Non-Suspension, High Back, Vinyl with Covered Back, Adjusters, 7-Degree Back Angle
SEAT, REAR {H.O. Bostrom Tanker 400CT} for SCBA; Two Individual Seats on One Riser, Non Suspension, High Back, Vinyl, with Covered Back and GRAB HANDLE, EXTERIOR (2) Chrome, Towel Bar Type, with Anti-Slip Rubber Inserts, for Cab Entry Mounted Left and Right Side at B-Pillar
MIRRORS (2) C-Loop, Power Adjust, Heated, LED Clearance Lights, Bright Heads and Arms, 7.5" x 14" Flat Glass, Includes 7.5" x 7" Convex Mirrors, for 102" Load Width
SEAT BELT All Red; 4 to 6
CAB MOUNTING HEIGHT EFFECTS High Cab in Lieu of Mid High Cab Mounting (Approx. 4.5")
CAB INTERIOR TRIM Diamond, for Crew Cab
Includes

: CONSOLE, OVERHEAD Molded Plastic with Dual Storage Pockets, Retainer Nets and CB Radio Pocket; Located Above Driver and Passenger

: DOME LIGHT, CAB Door Activated and Push On-Off at Light Lens, Timed Theater Dimming, Reading Lights; Integral to Overhead Console, Center Mounted

: SUN VISOR (3) Padded Vinyl; 2 Moveable (Front-to-Side) Primary Visors, Driver Side with Vanity Mirror and Toll Ticket Strap, plus 1 Auxiliary Visor (Front Only), Driver Side
MONITOR, TIRE PRESSURE Omit
WINDOW, POWER (4) And Power Door Locks, Front and Rear Doors, Left and Right, Includes Express Down Feature
CAB REAR SUSPENSION Air Bag Type
INSTRUMENT PANEL Flat Panel
ACCESS, CAB Steel, Driver Passenger Sides, Two Steps per Door, for use with Crew Cab
WHEELS, FRONT {Accuride 29300} DISC; 22.5x9.00 Rims, Powder Coat Steel, 5-Hand Hole, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with Steel Hubs
WHEELS, REAR {Accuride 29300} DUAL DISC: 22.5x9.00 Rims, Powder Coat Steel, 5-Hand Hole, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with Steel Hubs
PAINT, CAB Two-Tone, with 1-2 Breaks on Cab.
PAINT HOOD, CONVENTIONAL CAB Two-Tone, with 1-2 Breaks on Hood.
BDY INTG, REMOTE POWER MODULE (2) Mounted Under Cab or On Battery Box, Up to 6 Outputs & 6 Inputs Each, Max 20 amp per Channel, Max 80 amp Total; Includes 1 Module with Switch Pack Containing 6 Latched Switches, 1 Module with Hardware Only
BDY INTG, I/O EXP HARNESS {for Diamond Logic Builder} In-Cab wire harness (DLB) program only, Includes a harness with five blunt cut wires routed on lower left of instrument panel. Two ground active inputs and two (.5Amp) relay drivers outputs are provided
(2) TIRE, FRONT 315/80R22.5 Load Range L XDN2 (MICHELIN), 486 rev/mile, 75 MPH, Drive
(4) TIRE, REAR 315/80R22.5 Load Range L XDN2 (MICHELIN), 486 rev/mile, 75 MPH, Drive Cab schematic 21LWL
Location 1: 9408, Off White (Custom)
Location 2: 2973, 3225 Red (Custom)
Chassis schematic 932WL
Wheel: 2973, 3225 Red (Custom)
WARRANTY Standard for HV507, HV50B, HV607 Models, Effective with Vehicles Built July 1, 2017 or Later, CTS-2025A
CARB COMPANION PLAN {Navistar} for CARB B6.7 and L9 Engines
SPECIAL PROGRAMMING
(2) HADLEY HOOD MOUNTED AIR HORNS WITH STEERING WHEEL ACTIVATION AND PASS. FOOT SWITCH W/LANYARD
EXHAUST EXTENSION TO EXIT IN FRONT OF THE RIGHT REAR WHEEL

VEHICLE TOP SPEED - 2016 NFPA STANDARD

The rear axle/s shall be geared for a vehicle top speed in accordance with NFPA sections 4.15.2 and 4.15.3. Units with GVWR over 26,000 pounds shall be limited to 68 mph. If the combined tank capacity is over 1250 gallons of foam and water or the GVWR is over 50,000 pounds, the vehicle top speed shall be limited to 60 mph or the fire service rating of the tires, whichever is lower.

SAE J2433 ROLLOVER TESTING

The chassis shall comply with SAE J2422 Cab Roof Strength Evaluation. The Cab to Chassis Mounting System shall remain attached to the vehicle chassis and in an orientation similar to its original position when subjected to 20g deceleration load in the forward direction. Components in the mounting system may become distorted or broken but never dislodge from the original mounting location.

INT - TWENTY (20) INCH FRONT BUMPER EXTENSION

A 12" high, 96" wide, two (2) ribbed, bright finish stainless steel front bumper shall be provided. A twenty (20) inch front bumper extension, with tread plate gravel shield shall be provided.

FRONT MUD FLAPS

Black rubber mud flaps shall be provided on the front fenders.

COVER, DRIVER SIDE CAB STEP AREA - 4 DOOR

The driver side cab step area shall be covered with a polished aluminum tread plate cover which shall include the top, front and both ends. Access covers/ports shall be provided to access any chassis components when applicable. Step areas shall be provided for access to the cab.

The treadplate step overlay shall be easily removable for inspection of the batteries.

COVER, OFFICER SIDE CAB STEP AREA - 4 DOOR

The officer side cab step area shall be covered with a polished aluminum tread plate cover which shall include the top, front and both ends. Access covers/ports shall be provided to access any chassis components when applicable. Step areas shall be provided for access to the cab.

The treadplate step overlay shall be easily removable for inspection of the batteries.

INT ACC - AUTOMATIC TRACTION CONTROL

To further improve vehicle drive characteristics, the chassis shall be fitted with automatic traction control (ATC). This system shall control the drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to ensure efficient acceleration. The system shall be equipped with a dash-mounted light that comes on when ATC is controlling drive wheel slip.

DRIVER SEAT & OFFICER SEAT

NFPA compliant, air ride driver seat and air ride type SCBA, officer bucket seat shall be installed in place of the air ride drivers seat and officer two (2) men bench seat.

Note: Seats do not include SCBA brackets as standard.

STANDARD #MATM ANTENNA

A antenna mounting base model #MATM with 17' of coaxial cable shall be provided and installed on the cab roof.

The attached antenna wire shall run to the center console.

The Fire Department is responsible to have the correct antenna whip and termination installed once the apparatus is delivered.

CAB STEP LIGHTS- FOUR DOOR

Step lights shall be provided. There should be one (1) placed next to each cab door to illuminate the cab stepping surfaces. The step lights shall be mounted in a convenient location to provide appropriate illumination to the cab stepping surfaces. The step lights shall automatically activate when the parking brake is applied and marker lights are activated.

AUXILIARY AIR MANIFOLD - COMMERCIAL CHASSIS

All auxiliary air devices on the commercial chassis shall be fed from a common manifold. The common manifold shall be installed at an accessible location near the chassis air tanks. The manifold shall be fed by a 3/8" synflex airline plumbed from the primary air tank using a pressure protection valve. Unused ports shall be closed off using an appropriately sized plug.

UNDER CAB STORAGE COMPARTMENT

A compartment shall be provided under the extended portion of the cab on the officer's side. The compartment will be fabricated from unpainted stainless steel and will be provided with an aluminum tread plate door with a D ring handle and latch. The compartment will be sized per the available space in this location.

COMMERCIAL CHASSIS ELECTRICAL SYSTEM DESCRIPTION

The commercial chassis electrical system shall be provided as furnished by the original manufacturer. A customized interface shall be provided and designed, so as not to disturb any of the required chassis functions. The necessary interfaces shall only be provided in areas where load management is allowed or with accessory components provided on the chassis.

VDR/SEAT BELT SYS. INCLUDED IN COMMERCIAL CAB

VEHICLE DATA RECORDER

VDR download harness shall be supplied with the system to allow the data to be downloaded to a computer.

CENTER WELL

One (1) storage well constructed of stainless steel shall be installed in the gravel shield. This storage well shall be center mounted between the chassis frame rails. The bottom of the storage well shall have a minimum of four (4) drain holes.

TWO (2) VELCRO STRAPS ON CENTER WELL

The center, front bumper hose well shall be furnished with Velcro straps to secure the hose stored in the well.

The straps shall be attached to each side of the hose well with footman loops.

CENTER WELL - 150 FEET OF 1-3/4" HOSE

150’ of 1 3/4" hose

TOW HOOKS

Two (2) front painted tow hooks shall be fastened directly to the bumper support structure below the front bumper. The tow hooks shall be fastened with grade 8 bolts and nuts.

LICENSE PLATE BRACKET

A chrome plated, license plate bracket shall be provided on the front bumper of the apparatus.

TIRE PRESSURE MONITORING

Each tire shall be equipped with an LED tire alert pressure management system (Vecsafe equal) that shall monitor tire pressure. A chrome plated brass sensor shall be provided on the valve stem of each tire. The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi. The sensor shall activate an integral battery operated LED when the pressure of that tire drops 8 psi.

TRANSMISSION LOCK-UP

The automatic transmission furnished in the chassis shall have a lock-up assembly which brings the transmission to direct drive and prevents the transmission from shifting gears while in the pumping mode.

A positive braking system shall be provided to prevent vehicle movement during pumping operations. The air brakes furnished must satisfy this requirement.

12 VOLT ELECTRICAL SYSTEM TESTING

The apparatus low voltage electrical system shall be tested and certified by the manufacturer. The certification shall be provided with the apparatus. All tests shall be performed with the air temperature between 0°F and 100°F.

The following three (3) tests shall be performed in order. Before each test, the batteries shall be fully charged.

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 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.

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.

The total continuous electrical load shall be activated with the engine running up to the engine manufacturers governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded due to excessive battery discharge, as detected by the system, or a system voltage of fewer than 11.7 volts DC for a 12- volt system, for more than 120 seconds, shall be considered a test failure.

Following completion of the preceding tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm is activated.

The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of fewer than 11.7 volts shall be considered a test failure. The battery system shall then be able to restart the engine.

At the time of delivery, documentation shall be provided with the following information:

- Documentation of the electrical system performance test
- A written load analysis of the following;
- Nameplate rating of the alternator
- Alternator rating at idle while meeting the minimum continuous electrical load
- Each component load comprising the minimum continuous electrical load.
- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

DIRECT BATTERY GROUNDING STRAP

If the electrical system requires, direct grounding straps shall be mounted to the following areas; frame to cab, frame to body and frame to pump enclosure.

All exposed electrical connections shall be coated with "Z-Guard 8000" to prevent corrosion.

BATTERY DISCONNECT SWITCH

The chassis batteries shall be wired in parallel to a single 12 volt electrical system, controlled through a heavy duty master disconnect switch.

The master disconnect switch shall be located within easy access of the driver upon entering or exiting the cab.

SHORELINE INLET

One (1) Kussmaul "Non Auto Eject", 120 volt, 20 amp shoreline disconnect shall be provided for the on-board, 110 volt battery charging systems.

The shoreline inlet shall be equipped with a male receptacle.

The mating connector shall be included and shall be provided as loose equipment. A label shall be provided indicating voltage and amperage ratings.

SHORELINE INLET LOCATION

The shoreline receptacle shall be located in the driver's cab step well in a predetermined location.

SHORELINE INLET LABEL

A shoreline power receptacle information plate shall be permanently affixed at or near the power inlet. The plate shall indicate the following:

- Type of Line Voltage
- Current Rating in Amps Power Inlet Type (DC or AC).

BATTERY CHARGER/INVERTER

The chassis shall be equipped with a Kussmaul Auto Power 091-269-12-3000, fully automatic battery inverter/charger.

The unit shall contain a 100 amp, fully automatic battery charger to re-charge and maintain the chassis batteries when the shoreline connection has been made.

The unit shall also contain a built in inverter capable of providing 3,000 watts of continuous AC power and a 6,000 watt surge capacity.

The unit shall have a built in transfer switch capable of diverting AC power to AC loads during shoreline connection.

The unit will be mounted in the upper area of the R1 body compartment.

120 VOLT POWER STRIP REAR CREW AREA WIRED TO SHORELINE

A 120-volt household type power strip shall be located as directed in the rear crew area of the cab. The power strip shall be equipped with a minimum of six (6) outlets. The power strip shall be wired into the shoreline receptacle to provide a 120-volt power source for fire department equipment.

FRONT DOOR JAMB SWITCHES TO ACTIVATE ALL DOME LIGHT

Each side front door jamb switch shall activate all of the cab dome lights.

HAND HELD SPOTLIGHT

A hand-held spotlight shall be provided, it shall have a coil-cord, cigar lighter plug, an on/off switch and a 500 lumens LED lamp. A 12 volt power point shall be furnished to supply power.

IGNITION STUD - REAR CREW AREA

An ignition stud shall be installed in the rear crew area for items needing an ignition circuit (ie. mobile radio).

This stud has a maximum amperage of 20 Amps.

ONE (1) 13 INCH OUTLET STRIP NEXT TO BREAKER PANEL

One (1) 13 inch outlet strip shall be installed at a location TBD by the customer.

Each outlet strip shall have four (4) single household receptacles.

The outlet strip shall require a 120 volt circuit breaker to be installed in the load center to properly protect the circuit.

ENGINE COMPARTMENT WORK LIGHTS - TECNIQ LED

Two (2) LED lights shall be provided inside the engine enclosure that will provide at least 800 lumens each.

Each light shall have its own independent switch incorporated into the light head.

HOSE BED WORK LIGHT - SWITCH

The hose bed work light shall have a protected 12-volt switch at the rear body panel. The switch will be labeled "HOSE BED WORK LIGHTS."

CONTROL SWITCH IN CAB FOR LIGHT(S) ABOVE WINDSHIELD

Controls shall be provided in the cab control system (or optional mechanical switch) to turn the light(s) above the windshield on and off.

CONTROL SWITCH IN CAB FOR REAR OF BODY LIGHTS

Controls shall be provided in the cab control system (or optional mechanical switch) to turn the rear of body lights on and off.

CONTROL SWITCH ON PUMP PANEL FOR REAR OF BODY LIGHT

A switch shall be provided on the pump panel to turn the rear of body lights on and off.

CONTROL SWITCH IN CAB FOR DRIVER SIDE OF BODY LIGHT

Controls shall be provided in the cab control system (or optional mechanical switch) to turn the driver side of body lights on and off.

CONTROL SWITCH ON PUMP PANEL FOR DRIVER SIDE OF BODY

A switch shall be provided on the pump panel to turn the driver side of body lights on and off.

CONTROL SWITCH IN CAB FOR OFFICER SIDE OF BODY LIGHT

Controls shall be provided in the cab control system (or optional mechanical switch) to turn the officer side of body lights on and off.

CONTROL SWITCH ON PUMP PANEL FOR OFFICER SIDE OF BODY

A switch shall be provided on the pump panel to turn the officer side of body lights on and off.

CAMERA SYSTEM

A rear vision camera system shall be provided to allow the driver to visually see the rear of the apparatus while in the cab. The system shall include an ASA model # VOM719WP flat panel LCD color monitor mounted adjacent to the driver and a ASA model # VCMS155 color camera that shall be mounted at the rear of the vehicle. The rear vision camera shall be wired to automatically activate when the chassis transmission is placed in reverse.

CAMERA SYSTEM

One (1) formed aluminum diamond plate shield shall be provided and mounted over the rear view camera to protect it from being damaged.

CAMERA SYSTEM

The monitor for the rear vision system shall be mounted on the ceiling of the cab in easy view of the driver.

COMMERCIAL CHASSIS MARKER LIGHTS AND REFLECTORS

Cab marker lights and signaling devices shall be as provided on the commercial chassis cab from the original chassis manufacturer. FMVSS reflectors shall also be provided as required.

CAB STEP LIGHTS - LED STRIP LIGHTS

Polished, stainless steel horizontal surface mounted chassis step lights shall be provided and controlled with marker light actuation and park brake application.

Step lights shall be located to properly illuminate all chassis access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

FRONT BROW LIGHT

One (1) LED roof mount light shall be provided and installed. The mounting bracket shall attach to the lamp head and be machined to conform to the roof radius.The lamp head shall have one (1) dual stacked, white, LED module and shall generate 20,261 lumens.

The lamp head shall incorporate an adjustable downward angle to maximize the light effectiveness. The lamp head and brackets shall be powder coated white. The brow mounted flood lights shall be located above the windshield in the center of the cab.

WIRE UPGRADE FOR 12V HIGH AMP LIGHT - (1) BROW LIGHT

NFPA COMPLIANT WARNING LIGHT PACKAGE

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard.

The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" which includes disabling all white warning lights when the apparatus is in "Blocking Right of Way" mode.

WARNING LIGHT FLASH PATTERN - NFPA FLASH PATTERN

All of the perimeter warning lights shall be set to a default NFPA compliant flash pattern as provided by the light manufacturer.

LIGHT PACKAGE ACTUATION/CONTROLS

The entire warning light package shall be actuated with a single warning light switch located on the cab switch panel. The wiring for the warning light package shall engage all of the lights required for "Clearing Right of Way" mode when the vehicle parking brake is not engaged. An automatic control system shall be provided to switch the warning lights to the "Blocking Right of Way" mode when the vehicle parking brake is engaged.

LIGHT PACKAGE NFPA CERTIFICATION

The warning light system(s) specified above shall not exceed a combined total amperage draw of 45 AMPS with all lights activated in either the "Clearing Right of Way" or the "Blocking Right of Way"

The warning light system(s) shall be certified by the light system manufacturer(s), to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the General Requirements section of these specifications.

The NFPA required "Certificate of Compliance" shall be provided with the completed apparatus.

Any large truck as defined by NFPA shall have the lower zone warning lights mounted no higher than 62" to the optical center of the warning light from ground level. {No Exceptions}

LIGHTS BAR

An LED light bar with red and clear LEDs with clear lenses shall be provided and will be mounted on the roof.

If equipped, the forward facing white lights shall be automatically disabled for the "Blocking Right of Way" mode.

C-UPPER, WHELEN 900 SUPER LEDS

Two (2) Whelen, 900, super LED light heads shall be furnished and mounted one (1) on each side on the upper rear face of the body, facing rear.

UPPER ZONE C WARNING LIGHT LENS - RED

The upper zone C warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

UPPER ZONE C WARNING LIGHT BEZEL - CHROME

The upper zone C warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

B/D-UPPER FRONT, COVERED BY LIGHTS IN ZONE A-UPPER

The lighting requirement for this area is covered by the lights noted in Zone "A" - Upper.

B/D-UPPER REAR, WHELEN 600 SUPER LEDS

Two (2) Whelen, 600 super LED light heads shall be furnished and mounted one (1) on each side on the upper side face, towards the rear of the body, facing to each side of the unit. The lights shall be installed with a chrome plated mounting flange.

UPPER ZONE B/D REAR WARNING LIGHT LENS - RED

The upper zone B/D rear warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

UPPER ZONE B/D REAR WARNING LIGHT BEZEL - CHROME

The upper zone B/D rear warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

A-LOWER FRONT MOUNTING, COMMERCIAL CHASSIS

The lower zone A warning lights shall be mounted in the commercial chassis grille no higher than 62" from ground level.

A-LOWER FRONT, WHELEN 600 SUPER LEDS

Two (2) Whelen 600 super LED light heads shall be provided and installed one (1) each side.

LOWER ZONE A WARNING LIGHT LENS - RED

The lower zone A warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

LOWER ZONE A WARNING LIGHT BEZEL - CHROME

The lower zone A warning lights shall include red leds and a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

C-LOWER REAR, WHELEN 600 SUPER LEDS

Two (2) Whelen, 600, super LED light heads shall be provided and installed one (1) each side directly below the DOT stop, tail, turn and backup lights.

LOWER ZONE C WARNING LIGHT LENS - RED

The lower zone C warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

B/D-LOWER FRONT MOUNTING, COMMERCIAL CHASSIS

The lower zone B D warning lights shall be mounted on the sides of the commercial chassis hood at or forward of the centerline of the front axle. The light shall be mounted no higher than 62" from ground level.

B/D-LOWER FRONT, WHELEN 600 SUPER LEDS

Two (2) Whelen, 600 super LED light heads shall be provided and installed with one (1) on each side.

LOWER ZONE B/D FRONT WARNING LIGHT LENS - RED

The lower zone B/D front warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

LOWER ZONE B/D FRONT WARNING LIGHT BEZEL - CHROME

The lower zone B/D front warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

B/D-LOWER REAR, WHELEN 600 SUPER LEDS

Two (2) Whelen 600 super LED light heads shall be provided and installed with one (1) on each side.

LOWER ZONE B/D REAR WARNING LIGHT LENS - RED

The lower zone B/D rear warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

LOWER ZONE B/D REAR WARNING LIGHT BEZEL - CHROME

The lower zone B/D rear warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

WHELEN ION SURFACE MOUNT ON FRONT RUB RAIL

Two (2) Whelen Ion Series LED lights shall be furnished and shall be mounted on the front of the body rub rail.

The lights specified above shall be provided in addition to the NFPA required Optical Warning Light Package and shall be activated by the master emergency warning light control. Wiring for these lights shall be run through the Load Management System to ensure that the electrical system is not overloaded by the additional amperage draw requirements.

UPPER AUX. WARNING LIGHT LENS - RED

The upper auxiliary warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

LOWER AUX. WARNING LIGHT LENS - RED

The lower auxiliary warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

UPPER AUX. WARNING LIGHT BEZEL - CHROME

The upper auxiliary warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

LOWER AUX. WARNING LIGHT LENS - CHROME

The lower auxiliary warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

GROUND LIGHTS

One (1) 6" long ground light with stainless steel mounting bracket, shall be provided under each side cab door entrance step, four (4) total.

The ground lights shall turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

Each light shall illuminate an area at a minimum 30" outward from the edge of the vehicle.

GROUND LIGHTS BELOW PUMP PANEL RUNNING BOARD

One (1) 6" long ground light with stainless steel mounting bracket, shall be provided under each side pump panel running board, two (2) total.

GROUND LIGHTS REAR BODY CORNERS

One (1) 6" long ground light with stainless steel mounting bracket, shall be provided under each rear body corner, two (2) total.

CAB AND BODY GROUND LIGHTS ACTIVATE WITH PARK

The cab and body ground lights shall activate by engaging the parking brake.

CHASSIS MULTIPLEX SYSTEM

The commercial chassis multiplex system shall include solid state power switches, self-calibrating gauges and low current switch devices used for driver controls, like rocker switches and HVAC controls. The low current system and solid state switching results in maximum reliability and durability.

The Electrical system should consist of factory installed, Remote Power Modules (RPMs) and factory installed switches and warning lights. This combination of factory installed equipment eliminates the need to cut into the chassis wiring and central wiring to one point outside the cab.

Each vehicle shall be programmed by engineering and not only stored in engineering database, but also uploaded to enable any dealer location to maintain, troubleshoot or repair the entire system installed on the apparatus and NOT only the chassis.

This multiplex system controls both chassis and body functions including but not limited to emergency lighting, scene lighting, compartment lighting, and door ajar circuitry. Systems that utilize a multiplexed chassis with a hard wired body, or two different multiplex systems, may not be considered.

CHASSIS DIAGNOSTICS SYSTEM

Diagnostic ports shall be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic system shall include the following:

- A single port to monitor the engine, transmission and ABS system and diagnostics of the roll sensor (if applicable)
- Engine diagnostic switch (blink codes)
- ABS diagnostic switch (blink codes)
- Allison Transmission Codes (through touch pad shifter)

BODY ELECTRICAL SYSTEM

All electrical lines in the body shall be protected by automatic circuit breakers, conveniently located to permit ease of service.

Flashers, heavy solenoids and other major electrical controls shall be located in a central area near the circuit breakers.

All lines shall be color and function coded every 3", easy to identify, oversized for the intended loads and installed in accordance with a detailed diagram.

A complete wiring diagram shall be supplied with the apparatus.

Wiring shall be carefully protected from weather elements and snagging. Heavy duty loom shall be used for the entire length.

Grommets shall be utilized where wiring passes through panels.

In order to minimize the risk of heat damage, wires run in the engine compartment area shall be carefully installed and suitably protected by the installation of heat resistant shielded loom.

All electrical equipment shall be installed to conform to the latest federal standards as outlined in NFPA 1901.

DOOR OPEN INDICATOR W/ INTEGRAL AUDIBLE ALARM

An indicator light with an audible alarm, shall be functionally located in the cab to signal when an unsafe condition is present such as an open cab door or body compartment door, an extended ladder rack, a deployed stabilizer, an extended light tower or any other device which is opened, extended or deployed which may cause damage to the apparatus if it is moved.

This light shall be activated through the parking brake switch to signal when the parking brake is released.

DUNNAGE AREA LIGHTING

Two (2) stainless steel, horizontal surface mounted lights shall be provided in the dunnage area to provide adequate illumination of this area. These lights shall be switched in the same manner as the step lights.

COMPARTMENT LIGHT ACTIVATION

Compartment lighting shall be switched from an integral switch as provided by the roll up door manufacturer.

COMPARTMENT LIGHTS

Each individual equipment storage compartment shall be equipped with the AMDOR, Luma Bar, LED light fixture, mounted on each side of the forward (and rear) vertical door frame.

ROOF COMPARTMENT LIGHTS

A polished stainless steel, horizontal surface mounted compartment lights shall be provided and installed to ensure proper compartment illumination.

The lights shall be mounted to the roof compartment doors with gaskets and shall be activated with a magnetic door switch that shall be connected to the door ajar warning circuit.

MARKER/TURN LIGHTS @ EA SIDE OF BODY

Red LED marker lights with integral reflectors shall be provided at the lower side rear, having one (1) on each side.

Yellow LED side marker and turn lights shall be provided on the apparatus lower side, forward or rear axle that puts one (1) on each side, if the apparatus is 30' long or longer.

DOT MARKER LIGHTS @ REAR OF BODY

Red LED clearance lights shall be provided on the apparatus rear upper having one (1) on each side at the outermost practical location.

Red LED, 3-lamp identification bar will be provided on the apparatus rear center.

DOT AMBER REFLECTORS @ SIDE OF BODY

Yellow reflectors shall be provided on the apparatus body lower side, as far forward and low as practical with one (1) on each side if the apparatus is 30' long or longer.

DOT RED REFLECTORS @ REAR OF BODY

Red reflectors shall be provided on the apparatus rear with one (1) on each side at the outermost practical location.

LED LICENSE PLATE LIGHT

One (1) LED license plate light shall be provided above the mounting position of the license plate. The light shall be clear in color and shall have a chrome finish.

WHELEN 600 LED BRAKE, REVERSE, TURN W/ QUAD HOUSING

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED red combination tail and stop lights, shall be mounted one each side at the rear of the body.

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED amber arrow turn signal lights, shall be mounted one each side, on a vertical plane with the tail/stop lights.

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED white back-up lights, shall be mounted one each side on a vertical plane with the turn/tail/stop signals.

These lights shall activate when the transmission is placed in reverse gear.

Two (2) Whelen PLAST4V mounting flanges, installed one (1) on each side, shall be provided to mount the lights described above in one common mounting flange.

The fourth opening shall be for the lower rear warning lights.

The lights shall be mounted in order, from top to bottom, as described above.

BODY STEP LIGHTS, TECNIQ EON 3 LED, ALL DEVICES

A polished, stainless steel, horizontal surface mounted body step lights shall be provided and controlled with marker light actuation and park brake application.

Step lights shall be located to properly illuminate all body access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

PUMP ENCLOSURE WORK LIGHTS - TECNIQ LED

Two (2) LED pump enclosure work lights shall be provided inside the pump enclosure, providing 800 lumens each. Each light shall have its own independent switch incorporated into the light head.

WHELEN #PELCC HOSE BED LIGHTS-FRONT WALL

Two (2) Whelen model PELCC, chrome plated, surface mounted lights shall be mounted in the hose bed on the front wall to illuminate the hose bed area.

WHELEN M9 SERIES LED SCENE LIGHTS ON REAR OF BODY

Two (2) Whelen, M9LZC, super LED scene lights shall be provided, (1) one on each side of the rear body panel in a chrome plated flange.

Each light shall draw 6 amps and generate 6,500 lumens.

The scene lights shall be wired through the load management system.

WHELEN M9 SERIES LED SCENE LIGHTS ON DRIVER SIDE OF BODY

Two (2) Whelen, M9LZC, super LED scene lights shall be provided.

The scene lights shall be installed one rearward and one forward on the driver side of the body in a chrome plated flange.

Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be wired through the load management system.

WHELEN M9 SERIES LED SCENE LIGHTS ON OFFICER SIDE OF BODY

Two (2) Whelen, M9LZC, super LED scene lights shall be provided.

The scene lights shall be installed one rearward and one forward on the officer side of the body in a chrome plated flange.

Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be wired through the load management system.

REAR SCENE LIGHTS TO BE ACTIVATED BY REVERSE LIGHT

In addition to the cab mounted switch for the rear scene lights, the rear scene lights shall illuminate when the transmission is placed in reverse gear and the apparatus is operating as an emergency vehicle (Primary Warning switch on).

REAR TRAFFIC WARNING LIGHT

One (1) Whelen LED "Traffic Advisor", model TAL65 36", rear directional light shall be installed on the rear of the body.

The light shall be equipped with six (6) lamps.

The directional light shall be activated by a control module.

The control module shall be conveniently located near the driver's position.

The rear directional light shall be wired through the load management system of the unit.

TRAFFIC ADVISOR - RECESS MOUNTING IN REAR SHEET

The traffic advisor shall be recess mounted in the rear sheet.

GENERATOR

One Harrison 8000 watt Hydraulic Driven Generator, 68/34 amps, 120/240VAC, 60 Hz, 1-phase shall be provided.

The system shall be designed and assembled by a company with no less than 10 years experience in the manufacture of hydraulic driven generators. The system shall be tested prior to shipping and be accompanied with a test report. The generator shall be tested at various loads from no load to full load to ensure reliable power delivery at various loads.

The motor/generator shall be placed in a frame which affords protection to the components and provides a unitized mounting module containing the motor/generator, reservoir, oil cooler, filtration, on/off manifold containing a cross port check valve allowing the unit to be started and shut down remotely.

The generator shall be a commercial type with a heavy-duty bearing and of brush less design to ensure low maintenance. No brushes or slip rings shall be allowed. The reservoir shall include an oil level sight gauge, oil temperature gauge; fill cap, oil filter, and a venturi boost unit to provide positive pressure to the pump suction port.

The generator and motor shall be close coupled and aligned using a Morse taper with a through bolt to secure the motor to the generator. No two (2) bearing generators shall be used.

The system must be capable of producing the rated full power when driven from the vehicle PTO from idle to maximum engine speed.

The generator system must be able to operate on either a Constant Engaged PTO or a Hot Shift PTO. The Generator must be able to be used while the vehicle is either stationary or in motion.

The hydraulic motor and pump shall be of axial piston design to provide low internal leakage and a high degree of frequency stability. No gear pumps or motors shall be used. The pump shall match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands.

The system shall be capable of normal operations using a commonly available ISO 46 hydraulic fluid. All fluid service points shall be in close proximity to the reservoir for ease of scheduled maintenance.

When properly installed, the system shall be warranted for a period of not less than two (2) years or 2000 hours, whichever should come first.

The generator shall be remotely turned on/off by using a 12 VDC switch mounted on the cab dash.

Harrison shall provide a four (4) foot s/o cord so that it can be easily wired to the truck without the need for opening the junction box.

A Quadra meter containing the volt, amp, and frequency is to be provided and installed in a location that is away from the weather and water over spray. If a meter is to be installed in the elements then an upgraded digital meter is to be used.

GENERATOR

The generator shall be equipped with an additional updraft fan.

GENERATOR LOCATION

The generator shall be mounted above the pump enclosure.

Locating the generator greater than 144" from the main breaker panel may require the installation of an additional power disconnecting means.

GENERATOR RUNNING LIGHT

A 120 volt generator running light shall be installed on the cab dash.

GENERATOR RUNNING LIGHT

A 120 volt generator running light shall be installed on the pump panel.

HARRISON HOT SHIFT PTO

A hot shift PTO shall be provided on the transmission for the Harrison generator.

The PTO shall be controlled from the cab. The control shall include a PTO engagement switch and a PTO engaged indicator light.

DIGITAL QUAD METER FOR HARRISON GENERATORS

A weatherproof digital Quadra meter containing the volt, amp, and frequency shall be installed near the breaker panel.

WHELEN PIONEER 150 WATT 120V LED TELE LIGHTS REAR

Two (2) Whelen, model #PFP2AP 150 watt LED telescoping lights shall be provided. Each light shall be mounted to a Whelen, side mounted, push up scene light, deployable in a full 360 degree rotation. The tightening mechanism shall be of a twist lock design, the use of a knob or latch to release the pole in order to raise and lower the telescoping portion of the pole shall not be accepted.

The lights shall be mounted on the rear of the cab, one (1) each side. Wiring used for the lighting shall be a minimum of 16 gauge three (3) wire cable that is properly supported and protected from damage. Two (2) model #PFP2AP watt light heads shall require one (1) 120 V, 15 amp circuit breaker.

LIGHTS REAR OF CAB SWITCHED @ CAB DASH

Cab dash, with 12 volt switch

LIGHTS REAR OF CAB SWITCHED @ PUMP PANEL

Pump panel, with 12 volt switch

WHELEN PIONEER 150 WATT 120V LED TELE LIGHTS REAR OF BODY

TELESCOPING LIGHTS - REAR OF BODY

Two (2) Whelen, model #PFP2AP 150 watt LED telescoping lights shall be provided. Each light shall be mounted to a Whelen, side mounted, push up pole, deployable in a full 360 degree rotation. The tightening mechanism shall be of a twist lock design, the use of a knob or latch to release the pole in order to raise and lower the telescoping portion of the pole shall not be accepted. The lights shall be mounted on the front face of the body, one (1) each side. Wiring used for the lighting shall be a minimum of 16 gauge three (3) wire cable that is properly supported and protected from damage.

Two (2) model #PFP2AP 150 watt light heads shall require one (1) 120 V, 15 amp circuit breaker.

LIGHTS REAR OF BODY SWITCHED @ CAB DASH

Cab dash, with 12 volt switch

LIGHTS REAR OF BODY SWITCHED @ PUMP PANEL

Pump panel, with 12 volt switch

ELECTRIC CORD REEL #1

One (1) Hannay Model #ECR-1620-17-18, 120 volt, electric rewind cord reel shall be provided and wired to the breaker panel.

The reel shall be securely mounted and equipped with a rewind control adjacent to the reel.

ELECTRIC CORD REEL #1 LOCATION

The cord reel shall be mounted above the pump enclosure on the officer side.

ELECTRIC CORD REEL #1 ROLLER

A Hannay 4-way stainless steel roller assembly shall be provided. The roller assembly opening shall be the full width of the reel drum.

ELECTRIC CORD REEL #1 REWIND

A reel rewind switch(s) shall be provided adjacent to the reel.

ELECTRIC CORD REEL #1 CABLE

Two hundred fifty (250) feet of Type SO yellow 10/3 heavy duty electric cable shall be provided on the reel.

ELECTRIC CORD REEL #1 TERMINATION

One (1) NEMA L5-20R, 20 amp, three prong twist-lock receptacle shall be provided on the end of the cable.

ELECTRIC CORD REEL #1 JUNCTION BOX

A Circle-D Model #PF51GFCI-5P, four (4) outlet junction box(es) with one (1) NEMA 5-20R GFCI rated straight blade receptacle and three (3) NEMA L5-20R twist-lock receptacles with 6" pigtail with a NEMA L5-20P twist-lock plug shall be provided.

ELECTRIC CORD REEL #1 JUNCTION BOX HOLDER

A holder(s) constructed from 1/8" tread plate shall be provided for each cord reel(s) junction box. The location of the holder shall be adjacent to the cord reel roller assembly or as directed by the fire department.

ELECTRIC CORD REEL #1 CIRCUIT BREAKER

The circuit breaker used to protect any device attached to the cord reel shall be sized to the smallest electrical connection used.

ELECTRIC CORD REEL #1 BALL STOP

A cable ball stop(s) shall be installed on the cable to keep the end from passing through the roller assembly.

BACK-UP ALARM

A Code 3, model # CA360C, 107dBA back-up alarm, shall be provided and installed at the rear of the apparatus under the tailboard.

The back-up alarm shall activate automatically when the transmission is placed in reverse gear and the ignition is "on."

ELECTRONIC SIREN

One (1) Whelen # 295SLSA1, 100 watt electronic siren shall be provided featuring: bottom mount control head in cab, "Si-Test" self diagnostic feature, six (6) function siren, radio repeat, and public address.

The electronic siren and speaker shall meet the NFPA required SAE certification to ensure compatibility between the siren and speaker.

SIREN CONTROL

A dash mounted switch shall be provided for the driver to control the electronic siren.

WHELEN SA315P SPEAKER

One (1) Whelen, model # SA315P composite black siren speaker, shall be provided, recessed in the front bumper and wired to the electronic siren.

POLISHED STEEL ELECTRONIC SIREN SPEAKER GRILL

A custom electric siren speaker grill shall be provided.

HALE QMAX-150 1500 GPM SINGLE STAGE PUMP

- HALE QMAX-150
- 1500 G.P.M.

Single Stage The pump must deliver the percentage of rated capacity at the pressure listed below:

- 100% of rated capacity at 150 P.S.I. net pump pressure
- 100% of rated capacity at 165 P.S.I. net pump pressure
- 70% of rated capacity at 200 P.S.I. net pump pressure
- 50% of rated capacity at 250 P.S.I. net pump pressure.

The pump shall be of a size and design to mount on the chassis rails of commercial and custom truck chassis and have the capacity of 1500 gallons per minute (U.S. GPM), NFPA-1901 rated performance.

The entire pump shall be manufactured and tested at the pump manufacturer's factory. The pump shall be driven by a drive line from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance. The entire pump both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to performance specs as outlined by the latest NFPA-1901. Pump shall be free from objectionable pulsation and vibration. The pump body and related parts shall be of fine grain alloy cast iron with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable. Pump body shall be horizontally split, on a single plane in two sections for easy removal of the entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis.

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing shall be located immediately adjacent to the impeller (on side opposite the gearbox). The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel to be super-finished under packing with galvanic corrosion (zinc foil separators in packing) protection for longer shaft life. Pump shaft must be sealed with a double-lip oil seal to keep road dirt and water out of the gearbox.

The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance. Pump impeller shall be hard, fine grain bronze of the mixed flow design, accurately machined, and individually balanced. The vanes of the impeller intake eyes shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

PUMP RATIO

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

The manufacturer shall supply at time of delivery copies of the pump manufacturer's certification of hydrostatic testing, the engine manufacturer's current certified brake horsepower curve.

PUMP MOUNTS - MID-SHIP PUMPS

Extra heavy duty pump mounting brackets shall be furnished.

These shall be bolted to the frame rails in such a position to perfectly align the pump so that the angular velocity of the driveline joints shall be the same on each end of the drive shaft.

This shall assure full capacity performance with a minimum of vibration. Mounting hardware shall utilize Grade 8 bolts.

HALE MECHANICAL PUMP SEAL

The mid ship pump shall be equipped with a high quality, spring loaded, self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions.

This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 PSI.

The mechanical seal assembly shall be 2 inches in diameter and consists of a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat with a Teflon backup seal provided.

Only one (1) mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one piece pump shaft.

A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

HALE PUMP DRIVE UNIT, K GEARBOX - QMAX, QTWO

The drive unit shall be completely assembled and tested at the pump manufacturer's factory. Pump gearbox shall be of sufficient size to withstand up to 18,500 lbs. ft. of drive through torque of the engine system. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

Gearbox housing is constructed of high strength cast iron with no structural aluminum parts. The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine. All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut helical high contact design shall be provided with an exclusive Anti-Hop out Design which keeps the unit firmly in the gear selected. The more torque you put to the gearbox the tougher the grip to stay in gear. There will be no exceptions.

The gearbox is equipped with a power shift with progressive engagement to assure consistent reliable shift in pump/road gear. The shifting mechanism shall be a heat treated, hard anodized aluminum power cylinder, with stainless steel shaft. An in-cab control for rapid shift shall be provided that locks in road or pump. NO speed counter shall be furnished for the K-Gearbox. Any previously mentioned speed counter shall be null and void.

PUMP SHIFT

The drive unit shall be equipped with a power shift. The shifting mechanism shall be a heat treated, hard anodized aluminum power cylinder with stainless steel shaft. The pump shift control, pump engaged light and ok to pump indicator light shall be provided utilizing the multi-plex system. They shall be located in the lower left switch panel. Switch to be YELLOW in color to denote being for a strategic type switch function. A standard air solenoid pack shall be utilized to lock the transfer case in road or pump. This control shall be electronically interlocked through the multi-plex system to prevent inadvertent activation or deactivation. This allows the control to be interlocked with engine rpm, transmission gear status and park brake state. The switch positions and indicator lights shall be clearly marked. The pump shift switch shall also serve as the manual lockup switch; in case of air pressure loss.

PUMP SHIFT MANUAL OVERRIDE

An emergency manual pump shift control shall be furnished on the left side pump panel which may be utilized if the air shift control does not operate.

PUMP INSTALLATION - COMMERCIAL

HALE ANODE BLOCKS - ALLOY - 2 TOTAL

Two (2) Hale Alloy Anode blocks shall be provided and located one (1) on the suction side and one (1) on the discharge side of the pump to protect the pump from corrosion.

The Anodes shall be painted Safety Yellow for identification purposes.

AUXILIARY ENGINE COOLER

An auxiliary cooler or heat exchanger shall be installed in the engine compartment between the engine and the chassis radiator.

The cooler shall permit the use of water from the pump for cooling the engine.

The cooling shall be done without mixing engine and pump water.

CLASS ONE "SENTRY PRESSURE GOVERNOR" CONTROL "SPG"

Apparatus shall be equipped with a Class 1 “Sentry Pressure Governor” (SPG) that is connected to the Electronic Control Module (ECM) mounted on the engine.

The “SPG” shall operate as a pressure sensor (regulating) governor (PSG) utilizing the engines J1939 data for optimal resolution and response.

If J-1939 engine control is not supported by the engine manufacturer, then analog remote throttle control shall be provided by the Sentry display.

The Sentry display utilizes control algorithms that minimize pressure spikes during low or erratic water supply situations.

The Sentry display shall be backwards compatible to any engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain a consistent fleet fire-fighting capability and reduce operator cross training and confusion.

The Sentry display shall have the ability to use either a 300 PSI or 600 PSI pressure transducers for intake and discharge pressures.

Programmable presets for RPM and Pressure settings shall be easily configurable using the SPGs straightforward menu structure.

The “SPG” shall also include indication of engine RPM, system voltage, engine oil pressure, and engine temperature with audible alarm output for all. The “SPG” uses the J1939 data bus for engine information, requiring no additional sensors to be installed.

CLASS ONE STAINLESS INTAKE RELIEF VALVE

The apparatus shall be equipped with a Class 1 inlet relief valve that is of all stainless steel construction. The relief valve shall comply with NFPA 1901.

It shall have an adjustable pressure relief setting from 75 psi to 350 psi and is factory preset at 125 psi. The relief valve shall be used on the inlet side of the pump.

TRIDENT REMOTE PRIMING VALVE - FRONT SUCTION

An additional primer control valve shall be furnished to prime the front suction.

The Trident Emergency products RPV (remote priming valve) shall activate using the same air that powers the AirPrime system when the coinciding panel valve is depressed.

TRIDENT "MANUAL" AIR PRIMING SYSTEM

The priming pump will be a Trident air primer system.

A push in primer handle will open the priming valve and prime the pump.

ROTARY MASTER DRAIN VALVE

A rotary type, 12 port, master drain valve shall be provided and controlled at the lower portion of the side pump panel.

The valve shall be located in the pump compartment lower than the main body and connected in such a manner as to allow complete water drainage of the pump body and all required accessories.

Water shall be drained below the apparatus body and away from the pump operator.

DRAINS/BLEEDER "INNOVATIVE CONTROLS" LIFT UP @ ALL LINES

All lines shall drain through the master drain valve or shall be equipped with individual drain valves, easily accessible, and labeled.

One (1) individual "Innovative Control" lift up drain valve shall be furnished for each 1-1/2" or larger discharge port and each 2-1/2" gated auxiliary suction.

Drain/bleeder valves shall be located at the bottom of the side pump module panels. All drains and bleeders shall discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINE

Small lines within the pump enclosure shall be constructed from Synflex hose.

Uses include but are not limited to such lines as priming control, gauge lines, drain lines, air control valves, pump shift, supplemental cooling, foam flush, and air bleeder valves.

SUCTION INLETS - 6” INLETS

Two (2) 6" N.S.T. suction inlets shall be provided, one on the driver side and one on the officer side pump panel. A removable strainer shall be installed on each inlet.

SHORT NECK MAIN PUMP SUCTION INLETS

The main pump suction inlets shall be furnished with a short suction end, terminating with only the suction threads protruding through the side panel to minimize the distance an exterior appliance protrudes beyond the pump panel.

BEHIND PANEL MOUNT

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels. There will be no exceptions.

6" NST INTAKE CAP - DS

A 6" NST chrome plated long handle pressure vented cap shall be installed on the driver side intake.

6" NST INTAKE CAP - OS

A 6" NST chrome plated long handle pressure vented cap shall be installed on the officer side intake.

SUCT TO TERMINATE THROUGH RH FRONT FACE OF BUMPER

The front inlet terminates through the right side front face of the front bumper.

The suction shall be mounted so only the threads protrude through the bumper, allowing enough clearance for the hose coupling to be connected.

FRONT SUCTION 6" NST THREADS

A 6" NST front suction inlet shall be provided at the front of the vehicle, plumbed from the pump.

6" NST MALE THREADS ON FRONT SUCTION

The front suction pipe shall be equipped with a chrome, 6", NSTM thread adapter.

FRONT SUCTION, PLUMBING, 5" STAINLESS STEEL PIPING

The front inlet shall be plumbed utilizing 5", schedule 10, stainless steel piping, 45 degree elbows, and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the cab.

A manual drain shall be provided ahead of the front wheel and a panel controlled drain shall be provided aft of the front wheel.

A minimum of two (2) grooved pipe couplings shall be furnished in this assembly to allow for flex and serviceability.

HALE MIV BUTTERFLY VALVE FOR FRONT SUCTION

The front suction plumbing shall be fitted with a Hale Master Intake Valve (MIV), on the front suction inlet.

The valve shall be in the pump enclosure area with a manual override located directly on the valve actuator.

The valve body and all related components that are in contact with water shall be manufactured of fine grained, corrosion resistant bronze.

The valve housing shall incorporate a pressure relief valve, set at the pump manufacturers facility to a rating of 125 PSI.

The pressure relief valve shall provide protection for the suction hose even with the valve in the closed position.

The valve shall incorporate NFPA compliance, large diameter hose air bleed valve, controlled at the operator's panel.

HALE MIV ELECTRIC VALVE - FRONT SUCTION CONNECTION

The front suction valve shall be operated by a twelve (12) volt DC motor, controlled from the pump operator's panel.

It shall also incorporate a manual override, mounted at the valve.

The electric control shall incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position.

The valve shall not be able to move from fully open to fully closed in under three (3) seconds, in compliance with NFPA-1901.

6" NST FRONT SUCTION PRESSURE VENTED CAP

A 6", NST chrome plated long handle vented cap(s) shall be installed on front suction.

2-1/2" DS AUX SECONDARY SUCTION INLET REAR OF MAIN SUCTION

One (1) 2-1/2" auxiliary suction shall be provided at the driver side pump panel, to the rear of the main inlet (if space and other components allow).

The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

2-1/2" AKRON #8800 S.S. BALL VALVE, DS REAR AUX SUCTION

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the driver's side rear auxiliary suction.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

SWING CONTROL @ VALVE, DS REAR AUX SUCTION

A 1/4 turn swing control handle shall be provided on the driver side rear auxiliary suction valve.

2-1/2" OS AUX SECONDARY SUCTION INLET REAR OF MAIN SUCTION

One (1) 2-1/2" auxiliary suction shall be provided at the officer side pump panel, to the rear of the main inlet (if space and other components allow).

The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

2-1/2" AKRON #8800 S.S. BALL VALVE, OS AUX SUCTION

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the officer's side auxiliary suction.

The valve shall have an all brass body with flow optimizing, stainless steel ball and dual polymer seats.

SWING CONTROL @ VALVE, OS AUX SUCTION

A 1/4 turn swing control handle shall be provided on the officer side auxiliary suction valve.

TANK TO PUMP

One (1) 4" tank to pump line shall be piped through the front bulkhead of the tank with a 90 degree elbow down into the tank sump.

This line shall be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

A check valve shall be provided to prevent accidental pressurization of the water tank through the pump connection.

Connection from the valve to the tank shall be made by using a non-collapsible flexible rubber hose.

3" AKRON #8800 SERIES - S.S. BALL, VALVE , TANK TO PUMP

An Akron Brass 3" Generation II Swing-Out Valve shall be provided between the pump suction manifold and the water tank.

The valve shall have an all brass body with flow optimizing, stainless steel ball and dual polymer seats.

3" PUSH/PULL CONTROL FOR TANK TO PUMP

A push/pull control handle shall be located on the operator's panel with function plate.

TANK FILL LINE 2" FROM PUMP - SIDE MOUNT

One (1) 2" gated full flow pump to tank refill line controlled at the pump panel shall be provided. A deflector shield inside the tank shall be furnished. Tank fill plumbing shall utilize 2" high pressure hose for tank connection to accommodate flexing between components. There will be no exceptions.

2" AKRON #8800 SERIES - S.S. BALL TANK FILL, SIDE

An Akron Brass 2" Generation II Swing-Out Valve shall be provided between the pump discharge manifold and the water tank.

The valve shall have an all brass body with flow optimizing, stainless steel ball, and dual polymer seats.

PUSH/PULL CONTROL FOR TANK FILL

A push/pull control handle shall be located on the operator's panel with function plate.

DS MAIN DISCHARGE #1

A discharge shall be provided and located at the driver's side pump panel.

The driver's side discharges # 1 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

2-1/2" AKRON #8800 SERIES - S.S. BALL, DS #1

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the driver's side #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

DS #1 DISCH - 2-1/2" STRAIGHT NST & 30-DEGREE NST

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

2-1/2" NST PRESSURE VENTED CAP - DS DISCHARGE #1

A 2 1/2 " NST, chrome plated pressure vented cap shall be installed on driver's side #1 discharge.

SWING 1/4 TURN CONTROL FOR DS DISCHARGE #1 -SIDE M

The driver's side # 1 discharge valve shall be controlled by a 1/4 turn swing control handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The driver's side # 1 discharge shall be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge shall have a rugged, corrosion free stainless steel case and clear scratch resistant molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous, bronze, bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

DS MAIN DISCHARGE #2

A discharge shall be provided and located at the driver's side pump panel.

The driver's side discharges # 2 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

2-1/2" AKRON #8800 SERIES - S.S. BALL, DS #2

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the driver's side #2 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

DS #2 DISCH - 2-1/2" STRAIGHT NST & 30-DEGREE NST

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

2-1/2" NST PRESSURE VENTED CAP - DS DISCHARGE #2

A 2 1/2" NST, chrome plated, pressure vented cap shall be installed on driver's side # 2 discharge.

SWING 1/4 TURN CONTROL FOR DS DISCHARGE #2

The driver's side # 2 discharge valve shall be controlled by a 1/4 turn swing control handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The driver's side # 2 discharge shall be equipped with a 2.5", Innovative Controls pressure gauge.

The gauge shall have a rugged, corrosion free, stainless steel case and clear, scratch resistant, molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation, and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous, bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished, chrome-plated, stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

OS MAIN DISCHARGE #1

A discharge shall be provided and located at the officer's side pump panel.

The officer's side discharges #1 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

2-1/2" AKRON #8800 SERIES - S.S. BALL, OS #1, SIDE

An Akron Brass, 2 1/2" Generation II, Swing-Out Valve shall be provided for the officer's side #1 discharge

The valve shall have an all brass body with flow optimizing, stainless steel ball, and dual polymer seats.

OS #1 DISCH - 2-1/2" STRAIGHT NST & 30-DEGREE NST

The discharge valve shall be equipped with a straight, 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

2-1/2" NST PRESSURE VENTED CAP - OS DISCHARGE #1

A 2 1/2" NST, chrome plated, pressure vented cap shall be installed on officer's side # 1 discharge.

PUSH/PULL CONTROL FOR OS DISCHARGE #1 -SIDE MOUNT

The officer's side, # 1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The officer's side, # 1 discharge shall be equipped with a 2.5", Innovative Controls pressure gauge.

The gauge shall have a rugged, corrosion free, stainless steel case and clear, scratch resistant, molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous, bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished, chrome-plated, stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

OS MAIN DISCHARGE #2

A discharge shall be provided and located at the officer's side pump panel.

The officer's side discharges #2 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

2-1/2" AKRON #8800 SERIES - S.S. BALL, OS #2, SIDE

An Akron Brass, 2 1/2" Generation II, Swing-Out Valve shall be provided for the officer's side #2 discharge.

The valve shall have an all brass body with flow optimizing, stainless steel ball, and dual polymer seats.

OS #2 DISCH - 2-1/2" STRAIGHT NST & 30-DEGREE NST

The discharge valve shall be equipped with a straight, 2 1/2" NST, adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

2-1/2" NST PRESSURE VENTED CAP - OS DISCHARGE #2

A 2 1/2" NST, chrome plated, pressure vented cap shall be installed on officer's side #2 discharge.

PUSH/PULL CONTROL FOR OS DISCHARGE #2 -SIDE MOUNT

The officer's side, #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The officer's side, #2 discharge shall be equipped with a 2.5", Innovative Controls, pressure gauge.

The gauge shall have a rugged, corrosion free, stainless steel case and clear, scratch resistant, molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation, and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous, bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished, chrome-plated, stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

OS REAR DISCHARGE 3"

A 3" NST rear discharge shall be provided at the rear of the vehicle, plumbed from the pump.

OS REAR DISCHARGE THROUGH TANK SLEEVE @ OS REAR BODY

The rear discharge shall be plumbed through a pipe sleeve integrated into the water tank that shall terminate on the rear body panel, on the officer side of the body.

3" NST MALE THREADS ON OS REAR DISCHARGE

The officer side rear discharge pipe shall be furnished with 3" NSTM threads.

The discharge shall be equipped with a 30 degree droop terminating in 3" NSTM threads.

OS REAR DISCHARGE, PLUMBING, 3" STAINLESS STEEL PIPING

The officer side rear discharge shall be plumbed utilizing 3" schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

3" AKRON #8800 SERIES - S.S. BALL, VALVE OS REAR DISCHARGE

An Akron Brass 3" Generation II Swing-Out Valve shall be provided for the officer's side rear discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats

PUSH/PULL CONTROL FOR OS REAR DISCHARGE

The officer side rear discharge valve shall be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The officer side rear discharge shall be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

DECK GUN DISCHARGE

A deck gun discharge shall be plumbed from the pump to an area on top of the vehicle.

The deck gun piping shall be firmly supported and braced.

DECK GUN DISCH TERMINATE @ CENTER OF DUNNAGE

The deck gun discharge shall be located in the center of the dunnage area above the pump module. A pedestal type, 1/4" steel plate support assembly shall be provided to stabilize deck gun plumbing below deck gun mount flange.

3" NPT MALE THREADS ON DECK GUN DISCHARGE

The deck gun discharge pipe shall terminate with 3" NPT threads.

DECK GUN DISCHARGE

Deck gun height will be limited to the critical overall apparatus height listed in the spec. To avoid excessive travel heights the monitor will be positioned as low as practical while still allowing functionality of the water stream.

DECK GUN DISCHARGE, PLUMBING, 3" STAINLESS STEEL PIPING

The deck gun discharge shall be plumbed utilizing 3" schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the deck gun location.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

3" AKRON #8800 SERIES - S.S. BALL, VALVE DECK GUN

An Akron Brass 3" Generation II Swing-Out Valve shall be provided for the deck gun discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

PUSH/PULL CONTROL FOR DECK GUN DISCHARGE

The deck gun discharge valve shall be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The deck gun discharge shall be equipped with a 2.5" diameter Innovative Controls pressure gauge.

The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

#1 FRONT DISCHARGE 1-1/2"

A 1 1/2" front #1 discharge shall be plumbed to the front bumper of the vehicle.

1-1/2" NST CHICKSAN SWIVEL @ TOP DS FRONT BUMPER #1

The front #1 discharge shall terminate on the top driver's side of the front bumper extension gravel shield with a chrome 1 1/2" NST chicksan swivel adapter.

#1 FRONT DISCHARGE, PLUMBING, 2" STAINLESS STEEL PIPING

The front #1 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping, flexible hosing, 45 degree elbows, and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

Automatic discharge drains shall be provided at all low points in the plumbing.

2" AKRON #8800 SERIES - S.S. BALL, VALVE FRONT#1 DISCHARGE

An Akron Brass 2" Generation II Swing-Out Valve shall be provided for the front #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

PUSH/PULL CONTROL FOR FRONT #1 DISCHARGE

The front #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

1-1/2" NST FRONT #1 DISCHARGE PRESSURE VENTED CAP

A 1 1/2" NST chrome plated pressure vented cap shall be installed the front #1 discharge.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The front #1 discharge shall be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

LOWER SPEEDLAY

lower speedlay shall be a transverse hose bed, which shall be designed as an integral part of the pump module design, located forward of the pump above main inlet and side discharge connections.

Hose deployment shall be accomplished from either side of the apparatus.

The speedlay hose bed flooring shall be designed to be removable, constructed from stainless steel material.

SLIDE-OUT- POLY PROPYLENE TRAY FOR LOWER SPEEDLAY

A polypropylene three (3) sided "U" shaped slide out tray shall be provided for lower speedlay to allow easy loading of the hose from the vehicle. The tray shall be designed to slide out from either side of the vehicle.

The tray shall have a cut out on each side, so it may be used as a handle to remove. The handle area shall extend beyond the side panel on each end, allowing removal without getting one's fingers caught in the latch tray mechanism.

A retention system will be provided for the speedlay tray(s).

STAINLESS STEEL SCUFF PLATES - LOWER SPEEDLAY

The outer edge of the lower speedlay hosebed shall be trimmed stainless steel scuff plates. The scuff plate will reduce the clear opening of the speedlay on each side.

1-1/2" NST CHICKSAN SWIVEL - LOWER SPEEDLAY

The lower speedlay discharge shall terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter.

The hosebed rear wall shall be slotted to allow the swivel to through the wall, allowing the preconnected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

LOWER SPEEDLAY CAPACITY - 300 FEET OF 1-3/4" HOSE

lower speedlay shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 250 feet of 1-3/4" fire hose.

The hose shall be loaded in a double stack configuration.

LOWER SPEEDLAY, PLUMBING, 2" STAINLESS STEEL PIPING

The lower speedlay discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

2" AKRON #8800 SERIES - S.S. BALL, VALVE SPEEDLAY

An Akron Brass 2" Generation II Swing-Out Valve shall be provided for the lower speedlay discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

PUSH/PULL CONTROL LOWER SPEEDLAY

The lower speedlay discharge valve shall be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The lower speedlay discharge shall be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

MIDDLE SPEEDLAY

middle speedlay shall be a transverse hose bed, which shall be designed as an integral part of the pump module design, located forward of the pump just above the lower speedlay.

Hose deployment shall be accomplished from either side of the apparatus.

The speedlay hose bed flooring shall be designed to be removable, constructed from stainless steel material.

SLIDE-OUT- POLY PROPYLENE TRAY FOR MIDDLE SPEEDLAY

A polypropylene three (3) sided "U" shaped slide out tray shall be provided for middle speedlay to allow easy loading of the hose from the vehicle. The tray shall be designed to slide out from either side of the vehicle.

The tray shall have a cut out on each side so it may be used as a handle to remove. The handle area shall extend past the side panel on each end, allowing removal without getting one's fingers caught in the latch tray mechanism.

A retention system will be provided for the speedlay tray(s).

STAINLESS STEEL SCUFF PLATES - MIDDLE SPEEDLAY

The outer edge of the middle speedlay hosebed shall be trimmed stainless steel scuff plates. The scuff plate will reduce the clear opening of the speedlay on each side.

1-1/2" NST CHICKSAN SWIVEL - MIDDLE SPEEDLAY

The middle speedlay discharge shall terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter.

The hosebed rear wall shall be slotted to allow the swivel to through the wall, allowing the preconnected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

MIDDLE SPEEDLAY CAPACITY - 200 FEET OF 1-3/4" HOSE

middle speedlay shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

The hose shall be loaded in a double stack configuration.

MIDDLE SPEEDLAY, PLUMBING, 2" STAINLESS STEEL PIPING

The middle speedlay discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

2" AKRON #8800 SERIES - S.S. BALL, VALVE SPEEDLAY

An Akron Brass 2" Generation II Swing-Out Valve shall be provided for the middle speedlay discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

PUSH/PULL CONTROL MIDDLE SPEEDLAY

The middle speedlay discharge valve shall be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The middle speedlay discharge shall be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

UPPER SPEEDLAY

The upper speedlay shall be a transverse hose bed, which shall be designed as an integral part of the pump module design, located forward of the pump just above the lower speedlay.

Hose deployment shall be accomplished from either side of the apparatus.

The speedlay hose bed flooring shall be designed to be removable, constructed from stainless steel material.

SLIDE-OUT- POLY PROPYLENE TRAY FOR UPPER SPEEDLAY

A polypropylene three (3) sided "U" shaped slide out tray shall be provided for upper speedlay to allow easy loading of the hose from the vehicle. The tray shall be designed to slide out from either side of the vehicle.

The tray shall have a cut out on each side so it may be used as a handle to remove. The handle area shall extend past the side panel on each end, allowing removal without getting one's fingers caught in the latch tray mechanism.

A retention system will be provided for the speedlay tray(s).

STAINLESS STEEL SCUFF PLATES - UPPER SPEEDLAY

The outer edge of the upper speedlay hosebed shall be trimmed stainless steel scuff plates. The scuff plate will reduce the clear opening of the speedlay on each side.

1-1/2" NST CHICKSAN SWIVEL - UPPER SPEEDLAY

The upper speedlay discharge shall terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter.

The hosebed rear wall shall be slotted to allow the swivel to through the wall, allowing the preconnected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

UPPER SPEEDLAY CAPACITY - 200 FEET OF 1-3/4" HOSE

upper speedlay shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

The hose shall be loaded in a double stack configuration.

UPPER SPEEDLAY, PLUMBING, 2" STAINLESS STEEL PIPING

The upper speedlay discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

2" AKRON #8800 SERIES - S.S. BALL, VALVE SPEEDLAY

An Akron Brass 2" Generation II Swing-Out Valve shall be provided for the upper speedlay discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

PUSH/PULL CONTROL UPPER SPEEDLAY

The upper speedlay discharge valve shall be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESS GAUGE

The upper speedlay discharge shall be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge shall be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.

The gauge shall have black graphics on a white background.

ONE (1) ADDITIONAL SPEEDLAY TRAY

An additional speedlay tray shall be provided to allow the fire department to pre-loaded a spare hose load for the desired speedlay.

The tray shall be designed to have the same capacity of hose, matching the existing speedlay trays. The tray shall be shipped loose with the vehicle.

THREE (3) ADDITIONAL SPEEDLAY TRAYS

THREE (3) additional speedlay trays shall be provided to allow the fire department to pre-load spare hose for a desired speedlay.

THREE (3) additional trays shall be designed to have the same capacity of hose, matching the existing speedlay trays.

The tray shall be shipped loose with the vehicle.

VINYL END FLAPS FOR SPEEDLAYS

Vinyl coated polyester covers shall be provided on each side of the speed lays to retain hose in the speed lays.

The covers shall be secured with expandable loops sewn into the covers and hooks on the apparatus.

SPEEDLAY FLAP BLACK IN COLOR

The speed lay end flap shall be black in color.

FOAM SYSTEM STAINLESS PIPING - 1 INCH FROM FOAM SOURCE

All foam concentrate plumbing from the tank or auxiliary foam inlet to the foam system components shall be stainless steel and nonferrous material.

The foam system piping shall incorporate a check valve to prevent water from entering the foam tank; the discharge piping shall also include a check valve to prevent foam solution from back feeding into the discharge side of the pump. Individual discharge piping shall be as specified for each discharge.

The complete foam system shall be tested in accordance with NFPA-1901.

FOAMPRO 2001 CLASS "A AND/OR B" FOAM SYSTEM

A FoamPro model 2001, electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system shall be installed in the pumping system.

The system shall be capable of handling Class "A" foam concentrates and most Class "B" foam concentrates.

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 3% of calibrated settings over the advertised operation range when installed according to factory standards.

The system shall be equipped with a digital electronic control display suitable for installation on the pump panel.

Incorporated within the control display shall be a microprocessor that receives input from the system flow meter, 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 flow meter shall be installed in the discharge or manifold system specified to be foam capable.

A Full flow check valve shall be provided to prevent foam contamination of fire pump and water tank or water contamination of foam tank.

A 12 or 24-volt electric motor drive positive displacement foam concentrate pump, rated up to 2.5 GPM (9.5 L/min) @ 150 psi with operating pressures up to 400 psi (27.6 BAR), shall be installed in a suitable, accessible location.

The system shall draw a maximum of 40 amps @ 12V DC or 21 amps @ 24V DC.

A pump motor electronic driver (mounted to the base of the pump) shall receive signals from the computer control display and power the 1/2 hp (0.40 Kw) electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream.

The digital computer control display located on the pump operator's panel shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:

- Provide push-button control of foam proportioning rates from 0.1% to 9.9%, in 0.1% increments
- Show current flow-per-minute of water
- Show total volume of water discharged during and after foam operations are completed
- Show total amount of foam concentrate consumed
- Simulate flow rates for manual operation
- Perform setup and diagnostic functions for the computer control microprocessor
- Flash a low concentrate warning when the foam concentrate tank(s) runs low
- Flash a no concentrate warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank(s) empty

The digital computer control display shall interface with the options listed; provide dual foam calibration, and display separate totals for each foam concentrate used.

If two foam tanks are required and piped to the foam concentrate pump, either an electric dual tank valve or the manual dual tank valve shall be provided.

Components of the complete proportioning system shall include:

- Operator control and display
- Paddlewheel flow meter
- Pump and electric motor/motor driver
- Wiring harnesses
- Low-level tank switch (Switches)
- Electronic dual tank valve or manual dual tank valve (if more than one tank)
- Foam injection check valve
- Main waterway check valve

Accurate concentration proportioning can be achieved, based on the following water flows:

- 85 GPM water 3.0% concentration
- 260 GPM water 1.0% concentration
- 520 GPM water 0.5% concentration
- 1300 GPM water 0.2% concentration

Note: Multiple discharges plumbed to this system may affect performance if the flow rates are exceeded by any one discharge or the totality of multiple discharges at one time!

INJECTION SYSTEM DISCHARGE PLUMBING

The discharge piping shall be equipped with a properly sized flow meter sensor, based on the system's capabilities.

The foam system shall be plumbed to the following discharge/s through the discharge piping or manifold system:

INJECTION FOAM SYSTEM INSTALLED ON SPEEDLAY #1

Speedlay #1 discharge.

INJECTION FOAM SYSTEM INSTALLED ON SPEEDLAY #2

Speedlay #2 discharge

INJECTION FOAM SYSTEM INSTALLED ON SPEEDLAY #3

Speedlay #3 discharge.

FOAM SYSTEM INSTALLED ON FRONT DISCHARGE

Front discharge.

INJECTION FOAM SYSTEM INSTALLED ON OS REAR DISCHARGE

Officer's side rear discharge.

SIDE MOUNT PUMP MODULE

The pump module shall be a self-supported structure mounted independently from the body and chassis cab.

The design must allow normal frame deflection without imposing stress on the pump module structure or side running boards. The pump module shall be securely mounted to the chassis frame rails.

PUMP MODULE MATERIAL

The pump module shall be a welded frame work utilizing structural stainless steel components properly braced to withstand the rigors of chassis frame flex.

SIDE MOUNT DUNNAGE AREA

A dunnage area shall be provided above the pump enclosure for equipment mounting and storage. This area shall be furnished with a removable 3/16" tread plate floor and shall be enclosed on the sides.

NOTE: The size of this storage area may vary when top mounted crosslays, booster reel(s), etc., are specified and located in this area.

ONE (1) HOT WATER HEATER FOR PUMP ENCLOSURE

The pump enclosure shall be equipped with one (1) hot water heater which utilizes chassis engine coolant run through heater hoses to prevent freezing of pump components during pumping operations in low temperature climates.

The heater shall be switched on the pump operator's panel.

PUMP ENCLOSURE HEAT PAN

A bolt-on pump heat pan fabricated from stainless steel shall be provided on the underside of the pump enclosure to act as a supplementary heating system by entrapping chassis exhaust heat during low temperature pumping operations.

The heat pan shall have a slide out, removable bottom panel which should be removed for warm weather usage.

RUNNING BOARD STEPS

The driver and officer running board steps shall be fabricated of 3/16" tread plate plate. The outside edge on each step shall be fabricated with a double break, return flange. The steps shall be rigidly reinforced with a heavy duty support structure.

The running boards shall not form any part of the compartment design, and shall be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

SIDE MOUNT PUMP PANEL

The pump operator's control panel shall be located on the driver side of the apparatus.

The pump enclosure side panels shall be completely removable and designed for easy access and servicing.

SIDE MOUNT PANELS - 12 GAUGE BRUSHED STAINLESS STEEL

The left side operator's panel, gauge panel, right side pump panel and right side access door shall be fabricated from 12-gauge 304L stainless steel with a #4 (150/180 grit) standard brushed finish.

VERTICALLY HINGED GAUGE PANEL - SIDE MOUNT

A full width, vertically hinged gauge access panel shall be provided at the operator's position.

Chrome plated positive locks shall be provided along with chain holders to prevent the front of the gauge panel from coming in contact with other panels when open.

OFFICER SIDE VERTICALLY HINGED PUMP ACCESS DOOR

The officer's side pump panel shall be split and vertically hinged to provide complete access to the pump and plumbing on the officer's side of the pump enclosure.

The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed.

The drains located on the officer's side panel shall be fastened to the lower panel, which shall be stationary.

PANEL FASTENERS

Stainless steel machine screws and lock washers shall be used to hold these panels in position. The panels shall be easily removable to provide complete access to the pump for major service.

CAPS AND ADAPTERS SAFETY TETHER - BALL CHAIN

All applicable discharge and suction caps, plugs and adapters shall be equipped with chrome plated ball chain and secured to the vehicle.

PUMP PANEL DISCH./SUCTION TRIM PLATES

A high polished trim plate shall be provided around each discharge port and suction inlet opening to allow accessibility to the respective valve for service and repairs.

DISCHARGE GAUGE TRIM BEZELS

Each individual discharge gauge shall be installed into a decorative chrome-plated mounting bezel that incorporates valve-identifying verbiage and color labels, unless manufacturer supplied otherwise.

IDENTIFICATION PLATES

Color coded identification tags shall be provided for all gauges, controls, connections, switches, inlets and outlets.

PUMP OPERATOR'S PANEL, FULL WIDTH LIGHT SHIELD/STEP

The pump operator's panel shall be equipped with a light shield/step that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare.

The light shield shall be fabricated from the tread plate, which shall also serve as a step. The step shall be a minimum of 8" deep X the width of the pump panel.

(Note: On apparatus with lowered style crosslays, the light shield shall be from the back of the crosslays to the rear of the pump house).

The light shield shall be equipped with the following lights:

LED LIGHTS - PANEL LIGHT SHIELD/STEP

Four (4) LED lights.

One (1) light under the operator's panel light shield shall be actuated when fire pump is engaged in addition to the pump engaged light.

OS PUMP PANEL LIGHT SHIELD

The officer side pump panel shall be equipped with a light shield that shall be the full width of the control panel, and shall be positioned to cover the lights and prevent glare.

The light shield shall be equipped with the following lights:

LED LIGHTS - LIGHT SHIELD

Four (4) LED lights.

The lights shall be switched with the operator panel lights.

AIR HORN CONTROL BUTTON ON PUMP PANEL

Pump panel air horn actuation button labeled "EVACUATION" in white letters with a red background.

PUMP PRESSURE & VACUUM TEST PORTS @ PANEL

The pump panel shall be equipped with Vacuum Pressure test plugs to allow for test equipment to monitor pump pressure and vacuum levels.

Chrome plugs and labels shall be provided for the test ports.

4-1/2" CLASS ONE MASTER PRESSURE AND COMPOUND GAUGE

One (1) 4-1/2" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4-1/2" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided.

The master gauges shall be Class One Sub-Z II, interlube filled.

The gauge faces shall be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES - SINGLE STAGE

All applicable pressure gauges shall have a range of 0 - 400 P.S.I., and the compound gauge shall have a range of -30" - 0 - 400 P.S.I.

PUMP CERTIFICATION - 750 GPM & UP

The pump shall be third party performance tested to meet the requirements of NFPA-1901. There will be no exceptions.

WATER TANK

The water tank shall have a capacity of 1000 gallons, constructed from Poly material.

FILL TOWER

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 12" x 12" outer perimeter.

The fill tower shall be blue in color indicating that it is a water-only fill tower.

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 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 fill tower shall be fitted with an integral 4" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to a 4" coupling flush mounted into the bottom of the tank to allow water to overflow behind the chassis rear axle.

WATER TANK

A 3" drain plug shall be provided.

INTEGRAL FOAM TANK, 25 GAL. TANK "A"

Included in the total capacity of the water tank, a 25 gallon integral foam storage area shall be built into the water tank.

The foam tank shall have a latched fill tower, properly labeled as the foam fill point. A valved drain shall be provided.

WATER TANK LEVEL GAUGE

An Innovative Controls model #3030358, Ultra-Bright LED water level monitor shall be provided on the pump operator's panel.

The level gauge shall contain ten (10) high intensity LEDs on the display in a vertical pattern allowing the full, 3/4, 1/2, 1/4 and refill levels to be easily distinguished at a glance.

The display shall use a two-dimensional, two-element lens to refract the light from the LEDs to provide full 180 visibility for the level indications.

WATER TANK LEVEL GAUGE

The gauge shall use a pressure transducer #3030376-01 installed near the bottom of the water tank to determine the correct volume in the tank.

FOAM TANK "A" LEVEL GAUGE

An Innovative Controls model #3030393-01, Ultra-Bright LED foam level monitor shall be provided on the pump operator's panel.

The level gauge shall contain ten (10) high intensity LEDs on the display in a vertical pattern allowing the full, 3/4, 1/2, 1/4 and refill levels to be easily distinguished at a glance.

The display shall use a two-dimensional, two-element lens to refract the light from the LEDs to provide full 180 visibility for the level indications.

GAUGE TRANSDUCER

The gauge shall use a pressure transducer installed near the bottom of the foam tank to determine the correct volume in the tank.

FOAMPRO MANUAL DUAL TANK SELECTOR, A & B F

A FoamPro Model 3435-0079, panel mounted, manual dual tank selector valve which provides a water flush when switching between the tank selection shall be provided to allow the use of Class "A" or "B" foam tanks.

This item selection includes one (1) low level sensor and one (1) "Y" strainer for the additional foam tank configuration.

APPARATUS BODY GENERAL DESCRIPTION

The body side and compartment assemblies shall be designed and assembled to provide maximum strength and durability under all operating conditions. Special attention shall be taken to minimize corrosion on all fabricated parts and structural members of the body. All bolt-on components shall be provided with a dissimilar metals isolation barrier to prevent electric corrosion.

The body design shall also incorporate removable panels to access spring hangers, rear body mounts and fuel tank sending units. The body assembly shall be an all-welded configuration. The body shall be completely isolated from the cab and pump module structure.

Dimensions used in this specification shall be the general outer dimension taken from a typical line diagram of the apparatus. These dimensions shall not take into account items like material thickness, access panels, doors, and other installed options.

100" WIDE BODY, 29"/14" DEEP SIDE COMPARTMENTS

The fire body shall be 100" wide to provide the maximum amount of usable hose bed and compartment space. The side body compartments shall be 29" deep in any full depth areas and 14" deep in any split depth areas.

SWEEP-OUT COMPARTMENTS

Compartment floors shall be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors shall have the door opening flanges bend down to produce the sweep out design.

Compartments with roll-up style doors shall have the external floor flange stepped down to produce a sealing surface for the roll-up doors below the compartment floor.

The sweep out design shall also permit easy cleaning.

FASTENERS

All exterior fasteners shall be stainless steel screws.

NOTE: The use of pop rivets or self tapping screws as a trim fastener shall not be acceptable.

COMPARTMENT LOUVERS

Ventilation between compartments to the atmosphere shall be provided and located to avoid water entry into compartments.

ACCESS PANELS

Removable access panels shall be provided (if applicable) to access fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels shall be located in the rear compartments providing access to the lights and associated wiring.

The covers shall also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

STAINLESS STEEL BODY & COMPARTMENT CONSTRUCTION

The complete apparatus body and subframe shall be fabricated of 12 gauge, type-304-grade stainless steel sheeting with a tensile strength of 87,000 psi and a yield strength of 39,000 psi.

All body and compartment components shall be break-form design. Compartments are constructed of 12 gauge, type 304 stainless steel. This shall include compartment floors, side walls, and ceilings. No Exception. Compartments shall be formed from a single sheet of metal when possible. The exterior of the compartments shall be solid-seam welded. The corner seams shall be caulked with gray silicone caulking. All burrs shall be removed to eliminate sharp edges.

Interiors of compartments are to be left natural stainless steel with a swirl finish applied to give a lasting and pleasing appearance.

BODY SUBFRAME - STAINLESS STEEL

The body sub structure shall be an all welded configuration.

The sub structure shall be designed to totally support the full length and width of the body. The structure shall be welded to the body side compartments to incorporate the compartments into an integral part of the body weldment.

All crosstubes of the structure shall be capped and butt welded at their point of termination to prevent water from lying inside the superstructure. The super structure shall be bolted to the sides of the chassis frame at four (4) points. The two (2) forward mounting points shall utilize a spring mount to help isolate the body from chassis deflection.

This design shall provide storage capacity in each side compartment for a minimum of 500 lbs of equipment, and a minimum of 1000 lbs of equipment in the rear step compartment.

64" WIDE FENDER - CUSTOM

The body fender shall be 64" long, this shall allow for the suspension and related components to be contained within the fender, preventing any intrusion into the body compartment storage area. Bodies with notches in the front and/or rear compartment for suspension components are not acceptable. There will be no exceptions.

FENDER WITH STORAGE OPTIONS

DRIVER FORWARD FENDER - TRIPLE STORAGE SLOT

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size).

The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep.

The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices. This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

DRIVER REARWARD FENDER - TRIPLE STORAGE SLOT

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size).

The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep.

The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices. This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

OFFICER FORWARD FENDER - TRIPLE STORAGE SLOT

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size).

The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep.

The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices. This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

OFFICER REARWARD FENDER - SLIDE OUT ABSORBENT BIN

A slide out absorbent bin shall be installed in this fender position.

The storage bin shall be constructed of smooth stainless steel.

The bin shall be installed on sliding locking tracks that allow the bin to extend out of the body fender for dumping/filling.

There shall be a hinged lid on top of the storage bin to add material to the bin, and a spring loaded valve at the bottom to dispense material out of the bin.

Absorbent bins that are built into the fender and do not provide a means for sliding the bin out for loading and dispensing shall not be acceptable due to the difficulty in loading/unloading.

FENDER STORAGE COMPARTMENTS - PAINTED DOORS

The fender storage area(s) shall be enclosed by a hinged door fabricated from the same material as the primary body construction, and painted the primary body color.

The back side of the door shall have a section of Nylatron installed to protect the door surface from the items stored in the compartment.

Each door shall be tied into the compartment door ajar/do not move apparatus warning system. Each fender storage compartment door will be equipped with 3M model #1333 rubber "D" style door seal. There will be no exceptions.

LONG PUMPER BODY

LONG - DS FULL HEIGHT/SPLIT DEPTH

One full height/split depth compartment shall be provided forward of the rear wheels. The compartment dimensions shall be 49" wide x 68" tall and split depth. The compartment will be full depth in the lower 30" tall area, and split depth in the upper 38" tall area.

One high sided compartment shall be provided above the rear wheels. The compartment dimensions shall be 64" wide x 35-5/8" high and split depth.

One full height/split depth compartment shall be provided behind the rear wheels. The compartment dimensions shall be 56" wide x 68" tall and splith depth. The compartment will be full depth in the lower 30" tall area and split depth in the upper 38" tall area.

LONG - OS FULL HEIGHT/FULL DEPTH

One full height/full depth compartment shall be provided forward of the rear wheels. The compartment dimensions shall be 49" wide x 68" tall.

One high sided compartment shall be provided above the rear wheels. The compartment dimensions shall be 64" wide x 35-5/8" high.

One full height/full depth compartment shall be provided behind the rear wheels. The compartment dimensions shall be 56" wide x 68" tall.

All compartments will be full depth.

REAR STEP COMPARTMENT - FULL WIDTH, STANDARD HEIGHT

An equipment storage compartment shall be provided on the rear of the body, located at the rear step area.

The rear step compartment shall be 42" wide x 40" high x 29" deep.

The rear step compartment shall provide approximately 28 cubic feet of storage space.

REAR STEP COMPARTMENT - OPEN THROUGH SIDE WALLS

The rear step compartment shall be designed to have an open storage space leading to the side body compartments.

This open storage area shall be in the lower section of the side body compartments only.

REAR STEP COMPARTMENT - ROLLUP DOOR

The rear step compartment shall be equipped with a roll up style door.

REAR BODY DOOR FINISH - SATIN

The rear body door shall have a satin finish.

ROLL-UP DOORS

Roll-up doors shall be provided on all compartments.

The roll-up doors shall be constructed from aluminum extruded slats which shall have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal shall be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

The door shall be equipped with a lift bar style latch mechanism which shall latch at the bottom of the door mounting extrusion.

The roll-up door assembly shall be furnished with a spring-loaded, counterbalance assembly to assist in door actuation.

All running board and high side compartments shall be equipped with roll-up doors.

AMDOR BRAND ROLL-UP DOORS, SATIN

The roll-up doors shall be Amdor brand roll-up doors. They should be equipped with a satin finish and a dual durometer slat seal. The slats shall be made from a 1" double-wall aluminum and have a continuous ball and socket hinge joint. The interior of the door shall be made of a smooth interior door curtain, preventing equipment hang-ups. The bottom panel flange shall have a stainless steel lift bar latching system. The lifting bar will have a cut out for easy access if using gloves.

PULL DOWN STRAPS FOR SPECIFIC LOCATION: - L1, L2, L3, R1, R2, R3

PULL DOWN STRAPS FOR ROLL-UP DOORS

Pull straps shall be provided for all roll-up doors.

REAR COMPARTMENT DOOR MANUFACTURER - AMDOR

The rear compartment door brand shall be Amdor.

29" WIDE COFFIN COMPARTMENTS, FULL DEPTH 100" BODY, DRIVER'S SIDE

Roof hatch style compartments shall be provided the full length of the body, on the driver's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 28-1/2" inside width with a 25" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

29" WIDE COFFIN COMPARTMENTS, FULL DEPTH 100" BODY, OFFICER'S SIDE

Roof hatch style compartments shall be provided the full length of the body, on the officer's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 28-1/2" inside width with a 25" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

COMPARTMENT TOPS

Compartment ceilings shall be a fully welded design as part of the body construction process. Compartment designs that do not have a weld in the ceiling shall not be acceptable. There will be no exceptions.

REAR BODY PANEL

The rear body panel shall extend the full width between the body side compartments. This panel shall be full height from the rear step to the hose bed floor.

No part of the rear panel shall be attached to the booster tank.

The rear body panel material shall be tread plate as standard.

If Chevron striping is specified for the rear of the body then smooth stainless steel shall be utilized.

VINYL COMPARTMENT DOOR SILL PROTECTOR

Door sill protectors shall be provided and installed on all high side body compartments. The flaps shall extend 20" from the door opening when unrolled.

The door sill protectors shall be constructed of 22 ounce; heavy-duty vinyl coated polyester fabric (TXN 226).

BLACK VINYL SILL PROTECTOR

The door sill protectors shall be black in color and shall be provided at the following compartment door openings:

TREAD PLATE OVERLAY, FRONT OF SIDE COMPARTMENTS

The front face of the side compartments, next to the driver and officer pump panels shall be overlaid with full height tread plate protection panels.

The overlays shall cover the front face of the compartments only, they shall not wrap around to the door opening.

BODY RUB RAILS, C-CHANNEL - BRUSHED STAINLESS

Sacrificial brushed stainless steel C-Channel style, rub rails shall be mounted at the base of the body, extending outward from the body. The rub rails shall extend the full length of the main body. Rub rails shall be bolted to the body from the bottom side of the compartment area so it does not damage the body side panels on initial impact and provide easy replacement.

WHEEL WELL LINERS W/ FENDERETTE

Fully removable, one piece, bolt-in, stainless steel rear wheel well liner and fenderette will be provided. The wheel well liners will be natural metal finish and will protect the front and rear compartments and the main body supports from damage. Wheel well liners and fenderettes which are welded in place or are only partially removable shall not be considered. {No Exceptions}

REAR MUD FLAPS

Heavy duty mud flaps shall be provided behind the rear wheels.

WINCH RECEIVER POINT - EACH SIDE OF BODY

A 2" square receiver/hitch point shall be provided beneath the rub rail toward each side of the body for a portable winch.

The receiver/hitch point shall be a 2 1/2" x 2 1/2" x 1/4" full width of body seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to four points on the chassis frame rails. The receiver/hitch shall have a minimum capacity of 6000 pounds.

A 12V electrical connection with a quick disconnect compatible with the portable winch shall be provided adjacent to the receiver/hitch point.

A plastic end cap shall be provided for the quick disconnect.

EXTENDED REAR STEP - 12 D X 100 W - SQUARED OFF

The extended rear step shall be 12" deep and extends beyond the body compartments. The step shall have square corners, measuring 100" wide. The step shall be fabricated from 3/16" tread plate plate and be rigidly reinforced. The rear edge of the step shall be designed to accommodate the rear clearance lights. The steps recessed for the step reinforcement channel will help aid in protection. The step shall be bolted into place with a minimum 1/2" clearance gap between the step and rear body panel.

TERMINATE OS ROOF COMPARTMENT 18" FROM REAR OF BODY

To provide a safe egress to the top of the body, the officer side rear roof compartment shall terminate 18" forward of the rear of the body. This recessed pocket shall allow a stepping surface at the top of the roof access ladder. The floor and outboard wall of the recess shall be overlaid with 1/8" tread plate.

If the stepping surface from the floor to the top of the coffin box is over 18 inches, a folding step shall be installed.

A step light shall be provided to illuminate the stepping surfaces of this area.

NFPA compliant grab rails shall be provided where needed.

ZICO ROOF ACCESS LADDER

A Zico RL-2-6 Quic-Ladder, swing out down vehicle ladder shall be provided on the rear body corner of choice. The ladder shall store parallel to the body. A spring loaded locking handle shall keep the ladder stored to the body. Releasing the lock shall allow the ladder to pull out to allow for climbing at a comfortable and safe angle. The ladder shall automatically latch and will not retract until the scissor lock is raised.

The standard configuration has a two-rung fold-down section and a six-rung main ladder section. All rungs are cast aluminum with a flat non-skid surface for traction and safety. Handrails shall be 1 1/4" heavy walled aluminum tubing, covered between rungs by a ribbed black neoprene tubing, which provides a firm gripping surface.

ROOF ACCESS LADDER LOCATION OFFICER SIDE REAR BODY

The roof access ladder will be located on the officer's side rear body sheet.

GRAB RAILS, HANSEN KNURLED STAINLESS STEEL TYPE

All handrails shall be Hansen 1-1/4" outer diameter, knurled stainless steel, designed to meet NFPA 1901 requirements.

Molded gaskets shall be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

Grab rails shall be provided at the following specified locations.

Additional grab rails shall be provided adjacent to any additional steps specified to comply with NFPA 1901.

TWO (2) VERTICAL RAILS ON REAR

Two (2) vertical rails shall be mounted on the rear edge of the beavertails, one (1) each side.

ONE (1) HANDRAIL, BELOW HOSE BED LEVEL

One (1) horizontal, full width handrail shall be installed on the rear, below the level of the hose bed

INNOVATIVE CONTROLS LIGHTED STEP(S), BODY FRONT, DS

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, shall be provided on driver side body front to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

INNOVATIVE CONTROLS LIGHTED STEP(S), BODY FRONT, OS

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, shall be provided on officer side body front to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

INNOVATIVE CONTROLS LIGHTED FOLDING STEP(S), BODY

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, shall be provided on driver side body rear to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

NO FOLDING STEP(S), BODY REAR, OS

No folding steps shall be provided in this location.

PAINTED REAR TOW EYES, BELOW BODY

Two (2) painted tow eyes shall be furnished on the rear of the vehicle. The tow eyes shall be made from plate steel and shall be bolted directly to the chassis frame rails with grade 8 bolts. The tow eyes will extend below the body. The tow eyes shall be smooth and free from sharp edges. They will have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

WINCH RECEIVER POINT - REAR OF BODY

A 2" square receiver/hitch point shall be provided below the rear of the body for a portable winch.

The receiver/hitch point shall be a 2 1/2" x 2 1/2" x 1/4" seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to four points on the chassis frame rails.The receiver/hitch shall have a capacity of a minimum of 6000 pounds.

A 12V electrical connection with a quick disconnect compatible with the portable winch shall be provided adjacent to the receiver/hitch point.

A plastic end cap shall be provided for the quick disconnect.

STANDARD BED - FULL WIDTH COFFINS ON EACH SIDE

The hose bed shall be located directly above the booster tank and be free from all sharp objects such as bolts, nuts, and so on, in avoidance of damage to a fire hose. The hose bed side walls shall be formed by the inner wall of the coffin compartments on each side. The front wall shall be flanged inward 2" with a 1" downward return, providing additional rigidity to the front wall.

CUSTOMER SPECIFIED HOSE BED CAPACITY - 2000’ 4" AND 250’ OF 2.5"

The hose bed shall be designed with enough storage capacity to carry the following customer specified hose load: Feet of 5" supply hose, Feet of 3" supply hose, and Feet of 2-1/2" attack hose.

HOSEBED FLOORING - STAINLESS STEEL SLATS

Flooring is to be constructed from extruded stainless steel and have proper spaces for ventilation purposes. The flooring shall be smooth and free from sharp edges to avoid any hose damage. The hose bed floor shall be removable, providing access to the inner body framework.

TWO (2) - 1/4" ADJUSTABLE HOSE BED PARTITIONS

Two (2) fully adjustable 1/4" stainless steel hose bed partitions shall be provided. The partition shall be easily adjustable by channels, located at the front and rear of the hose bed. The partition shall be removable for access to the booster tank.

HOSE BED COVER - VINYL WITH CONTINUOUS BUNGEE

A hose bed cover shall be provided and installed. The cover shall be made from heavy-duty, vinyl coated polyester fabric. The cover shall be sewn with ultraviolet resistant thread and have 2" wide nylon webbing sewn around the perimeter to provide additional strength. The cover shall be secured to the top front body flange with quarter-turn fasteners and Velcro. The top side body flanges should be secured with a continuous bungee loop. A weighted flap shall be furnished on the rear of the cover with two (2) bungee cords.

VINYL MATERIAL COLOR - BLACK

The vinyl material shall be black in color.

SIDE OF WATER TANK LADDER STORAGE (DRIVER SIDE)

The ground ladders shall be stored vertically next to the water tank, behind the side body compartments. They will be located on the driver side of the apparatus. A hinged access door shall be provided on the enclosure that ties into the "Do Not Move Apparatus" warning system.

LADDER ACCESS DOOR SCUFF PLATE

The ladder access door shall have an aluminum diamond plate panel on the inner surface of the door.

ALCO-LITE PEL-24 24’ 2-SECTION EXTENSION LADDER

Alco-Lite model PEL-24; 24’, aluminum, two (2) section extension ladder shall be provided.

ALCO-LITE PRL-14 14’ ROOF LADDER W/FOLDING HOOKS

Alco-Lite model PRL-14; 14’, aluminum, straight roof ladder with folding hooks shall be provided.

ALCO-LITE FL-10 10’ FOLDING ATTIC LADDER (ALUM)

Alco-Lite model FL-10; 10’, folding, aluminum, attic ladder shall be provided.

PIKE POLE TUBE(S) - PUMPERS

A pike pole tube(s) shall be provided.

Each holder shall be accessible from the rear of the apparatus.

Each pike pole holder shall be labeled to indicate the pike pole length.

LOCATION PIKE POLE TUBE(S) - IN LADDER STORAGE COMPARTMENT

The pike pole tube(s) shall be mounted in the ladder storage compartment.

SUCTION HOSE STORAGE BUILT INTO BODY (BEHIND ROLLUP)

The suction hoses shall be located beneath the hose bed. There will be one (1) on the driver side and one (1) on the officer side. The hose storage area shall be accessed from the rear of the apparatus.

Note: On bodies with roll up style doors, the storage area shall be behind the roll of the door and will not affect usable compartment space. On bodies with hinged style doors, the storage area shall be in the top corner of the compartment.

A vertically hinged smooth stainless steel finish painted to match the body, access door with thumb type latches, shall be provided on the compartments. The door shall be provided with a door switch that ties into the "Do Not Move Apparatus" warning system.

TWO (2) 10’ SECTIONS OF 6" MAXI-FLEX LIGHTWEIGHT SUCTION HOSE

Two (2) 10’ sections of six (6) inch Maxi-Flex (PVC) suction hose with lightweight hard coat couplings shall be furnished. Couplings shall include a long handle with a female swivel on one end and a rocker lug male on the other. All threads shall be six (6) inch N.S.T.

6" NST, RED HEAD BARREL STRAINER W/MTG BKT

A 6" N.S.T., Red Head 140-60001 barrel type strainer(s) shall be provided and attached to the suction hose. A compartment mounting bracket shall also be provided to store the strainer(s) when not in use.

1/2 DEPTH ADJUSTABLE SHELF DESCRIPTION - RESCUE

Compartment shelving shall be constructed of stainless steel with a 2” upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in stainless steel strut channel.

Half depth adjustable shelves shall be located as indicated at each compartment description.

1/2 DEPTH ADJUSTABLE SHELF(S) LOCATED L-1

Located in the left side compartment #1

ADJUSTABLE SHELF DESCRIPTION - RESCUE

Compartment shelving shall be constructed of stainless steel with a 2" upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in stainless steel strut channel.

Adjustable shelves shall be located as indicated at each compartment description.

ADJUSTABLE SHELF(S) LOCATED L-1

Located in the left side compartment #1

ADJUSTABLE SHELF(S) LOCATED L-2

Located in the left side compartment #2

THREE (3) ADJUSTABLE SHELF(S) LOCATED R-1

Located in the right side compartment #1

TWO (2) ADJUSTABLE SHELF(S) LOCATED R-2

Located in the right side compartment #2

TRANSVERSE ADJUSTABLE SHELF DESCRIPTION

Transverse compartment shelving shall consist of stainless steel, with a 2" lip on all four (4) sides. The shelving shall be vertically adjustable by mounting in heavy duty stainless steel Unistrut "C" channel tracking material, securely fastened to the transverse compartment walls. Transverse adjustable shelving shall be as indicated at each compartment description.

TWO (2) TRANSVERSE ADJUST SHELF LOCATED, L-3/R-3

Located in the left/right compartment #3

600# SM 1/2 DEPTH FLOOR MOUNTED, ROLLOUT TRAY DS REAR

Half depth floor mounted roll-out trays shall consist of heavy duty stainless steel, roller bearing slide tracks with a load rating of 600 pounds, securely fastened to the compartment floor. The slide shall have a pull type latch to secure the slide in the desired position. The slide tracks shall have a 100% extension.

The tray shall be fabricated from stainless steel with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray.

The 600 pound, half depth, floor mounted roll out trays shall be as indicated at each compartment description.

600# SM 1/2 DEPTH ROLLOUT TRAY, LOCATED OS REAR

Half depth floor mounted roll-out trays shall consist of heavy duty stainless steel, roller bearing slide tracks with a load rating of 600 pounds, securely fastened to the compartment floor. The slide shall have a pull type latch to secure the slide in the desired position. The slide tracks shall have a 100% extension.

The tray shall be fabricated from stainless steel with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray.

The 600 pound, half depth, floor mounted roll out trays shall be as indicated at each compartment description.

600#, FLOOR MOUNTED, ROLLOUT TRAY DESC. REAR COMPARTMENT

Floor mounted roll-out trays shall consist of heavy duty stainless steel, roller bearing slide tracks with a load rating of 600 pounds, securely fastened to the compartment floor. The slide shall have a pull type latch to secure the slide in the desired position. The slide tracks shall have a 100% extension.

The tray shall be fabricated from stainless steel with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray.

The 600 pound floor mounted roll out trays shall be as indicated at each compartment description.

TRAFFIC CONE HOLDER

A stainless steel swing out traffic cone holder shall be provided on the right side of the tailboard to allow for the storage of at least 8 (TC-51B) traffic cones.

600# SLIDEMASTER ROLLOUT TRAY, LOCATED L-3 - 100%

Located in the left side compartment #3

600# SLIDEMASTER ROLLOUT TRAY, LOCATED R-1 - 100%

Located in the right side compartment #1

600# SLIDEMASTER ROLLOUT TRAY, LOCATED R-3

Located in the right side compartment #3

MARINE GRADE 3/4" PLYWOOD ON REAR WALL OF SPECIFIED COMPARTMENT

Marine grade 3/4" plywood shall be provided on the rear wall of the specified compartment(s) for mounting of loose equipment. The plywood shall be 3/4" marine grade plywood that shall be custom cut for the specified compartment. Each piece of plywood shall be varnished on both sides for protection. Plywood material shall be located in the following compartment(s):

TURTLE TILE MATERIAL ON ALL COMPARTMENT FLOOR

Turtle Tile brand floor material shall be installed on all compartment floors.

The Turtle Tile shall be custom installed to provide full floor coverage.

FLOORING MATERIAL ON SHELF(S) OR TR

Floor matting material shall be provided on the noted quantity of specified shelves or roll-out trays.

FLOORING MATERIAL COLOR (BLACK IS DEFAULT)

The compartment flooring color shall be black.

VERTICAL PULL OUT TOOL BOARD, 3/4" PLYWOOD, #250

Vertical pull out tool boards shall be provided. Each tool board shall be 3/4" marine grade plywood, coated with a clear polyurethane allowing mounting of equipment on both sides of the tool board. Each tool board shall be attached to #250 rated slides, one at the top and one at the bottom of the tool board. Stainless steel angles shall attach the slides to tracking to allow horizontal adjustments. A gas shock shall be used to secure each tool board in the stored and deployed position.

Vertical pull out tool boards shall be as indicated at each compartment description.

VERTICAL PULL OUT TOOL BOARD(S) LOCATED L-2

Vertical Pull Out Tool Board(S) Located L-2

RESPOND READY TOOLBOX

A custom Respond Ready cabinet will be added to a specified body compartment mounted on the floor. The cabinet shall be approximately 30 inches wide, 20 inches tall and full depth. The cabinet will be divided into six storage areas with each area being approximately 10 inches high x 16 inches wide. The drawers will be locking.

GENERAL PAINT DESCRIPTION

The apparatus body shall be painted with high quality paint product. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all surfaces shall be pre-treated with conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat. • Sealer/Primer - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- A lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- High solid clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where the material is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the sheet metal or extrusions in all locations where the material has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

GENERAL PRIMER & PREP DESCRIPTION

All exposed welds shall be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized.

After final body work is completed, grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

GENERAL FINISH PAINT DESCRIPTION

The body shall be finish sanded and prepared for final paint.

Upon completion of final preparation, the body shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint.

Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

4-DR TWO TONE AS APPROVED BY CHASSIS MFG. - PPG - 2185 WHITE (CAB UPPER)

The commercial cab exterior shall be finish painted in a two-tone color scheme by the chassis manufacturer with Purchaser's choice of colors as listed:

- PPG 71528
- PPG 2185
- PPG 8000
- PPG 73841
- PPG 71663
- PPG 83841
- PPG 71969

- PPG 71660
- PPG 75481
- PPG 71698
- BLACK

COMMERCIAL CAB PAINT FINISH

The chassis shall be painted and detailed as provided from the chassis OEM and shall meet their quality guidelines.

WHEEL AND HUB PAINT

The chassis wheels shall be painted as provided by the commercial chassis manufacturer.

BODY BUFFING & FINISH

The visible and exposed areas of the body shall be buffed and detailed.

INSIDE/UNDERSIDE BODY PAINT

The inside and underside areas of the complete body assembly shall be painted black using a Sikkens paint system, prior to the installation of the body on the chassis or torque box.

COMPARTMENT INTERIOR FINISH

The interior of the compartments shall be finish painted with Multispec #7247 White Marble Stone scuff resistant paint to provide a protective application over all of the compartment interior surfaces.

FENDER COMPARTMENT INTERIOR

The interior of the fender storage compartments (if fender compartments are specified) shall be finish painted job color.

PUMPHOUSE & PLUMBING PAINT

The pump enclosure and pump/plumbing within the pump enclosure shall be painted black.

SINGLE COLOR BODY PAINT SCHEME - PPG - 47010 YELLOW (CAB LOWER/BODY)

The body paint finish shall be Sikkens paint system in a single color to match customer furnished paint codes and requirements.

PINT OF TOUCH-UP PAINT

One (1) pint of each exterior color paint for touch-up purposes shall be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery the vehicle, the interior and exterior be cleaned and detailed.

The finalization process detailing shall include installation of NFPA required labels, checking fluid levels, sealing and caulking required areas of the cab and body, rust proofing, paint touch-up, etc.

SCOTCH-LITE STRIPE

A four (4) inch high "Scotch-Lite" stripe shall be provided.

The stripe shall be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit.

The Scotch-Lite stripe layout shall be determined by the Fire Department.

WHITE SCOTCH-LITE

The Scotch-Lite shall be white in color.

4" SCOTCH-LITE "Z" IN STRIPE

A four (4) inch simple "Z" effect shall be incorporated into the Scotch-Lite scheme on the body. Final layout of this configuration shall be determined by the Fire Department.

REAR CHEVRON STRIPING

REAR CHEVRON STRIPING SHALL BE YELLOW AND RED

50% VERTICAL SURFACE

At least 50% of the rear facing vertical surface shall be covered with alternating strips of reflective striping.

RUBY RED & LEMON YELLOW SCOTCH-LITE

The Scotch-Lite shall be Ruby Red and Lemon Yellow in color.

MISCELLANEOUS EQUIPMENT

The following equipment shall be mounted as specified or as loose equipment provided with the completed apparatus at the time of delivery:

ROAD SAFETY KITS

A road safety kit shall be furnished with the following equipment:

- 2 1/2 lb. B-C fire extinguisher
- Triangle safety reflectors.

WHEEL CHOCKS

Two (2) Zico model #AC-32 non-folding wheel chocks shall be provided and mounted as directed by the fire department.

GENERAL ONE (1) YEAR WARRANTY

Purchaser shall receive a General One (1) Year or 24,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0001. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

ELECTRICAL ONE (5) YEAR WARRANTY

Purchaser shall receive an Electrical One (5) Year warranty. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

BODY STRUCTURE (STAINLESS) (30) YEAR WARRANTY

Purchaser shall receive a Body Structure (Stainless) Thirty (30) Years warranty. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

PAINT AND FINISH (EXTERIOR CLEAR COATED) WARRANTY

Purchaser shall receive a Paint and Finish (Exterior Clear coated) Non-Prorated Ten (10) Years limited warranty. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

PLUMBING AND PIPING (STAINLESS STEEL) WARRANTY

Purchaser shall receive a Plumbing and Piping (Stainless Steel) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0800. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

5 YEAR LETTERING WARRANTY

The apparatus manufacturer will provide a five (5) year warranty against defects in material and workmanship for all graphics processes. Any valid claims must be made in writing within 15 days of the determination of any defects to the manufacturer's fire apparatus. The manufacturer will at its option make any necessary repairs either at a local authorized service center or at the factory if required. The manufacturer will make the final decision as to where the repairs are to be made and any transportation cost is the owner's responsibility. The manufacturer will at its option, repair or replace any verified defects in workmanship or materials at no cost to the owner provided all the requirements of this warranty have been met.

The manufacturer will not be liable to the original purchaser or anyone else for consequential, incidental, special or direct damages, including, but not limited to, any claims for loss of profits, downtime, loss of use or inconvenience. THE COMPANY MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND SPECIFICALLY, DISCLAIMS ANY IMPLIED WARRANTY INCLUDING THE WARRANTY OF MERCHANTABILITY.

The manufacturer continually strives to improve its products and therefore, reserves the right to make improvements or changes without incurring any obligations to make such changes or additions to equipment previously sold.

1 YEAR BRIGHTWORK WARRANTY

The manufacturer warrants all bright finish components used in the construction of the apparatus against defects and workmanship provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original user-purchaser for a period of one (1) year from the date of delivery/acceptance to the original user-purchaser, whichever occurs first.

The expressed warranty excludes corrosion or degradation of bright finished components caused by damage to the component.

LIFETIME POLY TANK WARRANTY - ALL TANKS

The proposed water tank will be warranted by the water tank manufacturer for the "Lifetime" of the unit. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

HALE FIRE PUMP WARRANTY FULL 5 YEAR LABOR

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale shall be free of defects in material and workmanship for a period of five (5) years from the date product is first placed into service or five and one-half (5 1/2) years from date of shipment by Hale, whichever period shall be first to expire. Within this warranty, Hale will cover parts and labor for the entire warranty period.

FOAM PRO 2000 SERIES STANDARD WARRANTY

The liability of FoamPro under the foregoing warranty will be limited to the repair or replacement at FoamPro's option without charge for labor or materials of any parts upon return of the entire pump, system or other product or of the particular part to the FoamPro factory within the warranty period, at the sole expense of the purchaser, which part will upon examination appear to FoamPro's satisfaction to have been defective in material and workmanship.

CLASS 1 - PRODUCT WARRANTY

Class 1 warrants that any equipment of our own manufacture (or manufactured for us pursuant to our specifications) found to have defects in material or workmanship during normal use and service, will be repaired or replaced (at our opinion) free of charge, provided that written notice of such defect is received by us within two (2) years, (three 3 years on liquid filled gauges) after initial shipment.

AKRON - 5 YEAR LIMITED WARRANTY

The limited warranty set forth here against defective materials or workmanship for a period of five (5) years will be given by Akron Brass Co. with respect to Akron Brass Co. products purchased and used in the United States and Canada respectively. All Akron valves are warranted for 10 years.

AKRON HEAVY DUTY VALVE - 10 YEAR WARRANTY

Akron Brass warrants Heavy Duty Swing-Out Valves for a period of ten (10) years after purchase against defects in material or workmanship. Akron Brass shall repair or replace any Heavy Duty Swing Out Valve which fails to satisfy this warranty.

CLASS 1 - ELECTRICAL PRODUCT WARRANTY

Class 1 warrants that any equipment of our own manufacture (or manufactured for us pursuant to our specifications) found to have defects in material or workmanship during normal use and service, will be repaired or replaced (at our option) free of charge, provided that written notice of such defect is received by us within two years (three for liquid-filled gauges) after initial shipment.

All equipment requiring repair or replacement under this warranty will be returned prepaid to Class 1. Such returned equipment will be examined by us and, if found to be defective as a result of materials failure or workmanship, will be repaired or replaced at no charge.

CORROSION TREATMENT

Upon apparatus completion, the underside of the apparatus, from the pump enclosure-back, shall have anti corrosion film applied to help inhibit rust and the corrosion process. The semi-firm wax film shall be applied by air spray method. The film shall be applied as a minimum to the following areas: body substructure, underside of all body compartments, running board supports and rear step supports. No film shall be applied directly to the exhaust system or wheel wells.

NOTE: The film shall remain semi-firm to promote self-sealing. The film may leave a light tinted color to those areas treated.

ADDITIONAL ITEMS SHIPPED WITH VEHICLE

- 1 - Bag of assorted stainless steel nuts and bolts

OPTIONS

Please provide options for the following:

- Harrison 8kw Generator
- Custom Chassis in lieu of commercial International or Freightliner

CHASSIS SPECIFICATION

MODEL

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

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2025or later model year.

COUNTRY OF SERVICE

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

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

CAB AND CHASSIS LABELING LANGUAGE

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English. All applicable caution, warning, and safety notice labels shall be Innovative Controls brand. Where applicable to the location within the specific layout and label package of the cab and chassis, the labels shall include decorative chrome bezels. Designs shall include bezels that fit individual labels or packaged configurations of labels in certain common locations.

APPARATUS TYPE

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

VEHICLE TYPE

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

VEHICLE ANGLE OF APPROACH PACKAGE

The angle of approach of the apparatus shall be a minimum of 8.00 degrees.

NFPA1901 Angle of Approach definition:
"To determine the angle of approach, place a thin steel strip against the front of the tires where they touch the ground or stretch a tight string from one front tire to the other at the front where they touch the ground. Determine the lowest point (component or equipment) on the vehicle forward of the front tire that would make the smallest angle of approach. Hang a plumb bob from the lowest point and mark the point on the ground where the point of the plumb bob touches. Measure the vertical distance from the ground to the point where the plumb bob was hung (distance *V*). Measure the horizontal distance from the plumb bob point to the steel strip or string running from front tire to front tire (distance *H*). Divide the vertical distance by the horizontal distance. The ratio of *V/H* is the tangent of the angle of approach. If the ratio is known, the angle of approach can be determined from a table of trigonometric functions of angles or from a math calculator. The standard requires a minimum angle of approach of 8.00 degrees: since the tangent of 8.00 degrees is 0.1405, if *V* divided by *H* is 0.1405 or larger, the angle of approach is 8.00 degrees or greater."

AXLE CONFIGURATION

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

GROSS AXLE WEIGHT RATINGS FRONT

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

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

GROSS AXLE WEIGHT RATINGS REAR

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

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

PUMP PROVISION

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the vehicle is shifted into pump mode while the transmission is in neutral and the transmission output speed translates to less than 1 mph. When the conditions are met the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally.

WATER & FOAM TANK CAPACITY

The chassis shall include a carrying capacity of 750 gallons (2839 liters) to 1250 gallons (4732 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.

CAB STYLE

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

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

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

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

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

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

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

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner in the non-raised roof area and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 51.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

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

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

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

OCCUPANT PROTECTION

An IMMI 4Front® occupant protection system shall be installed in the vehicle's cab. The system shall inflate three (3) air bags in the following locations:

- Steering wheel air bag to protect the head and neck of the driver
- Knee bolster air bag to protect the driver's legs
- Knee bolster air bag to protect the officer's legs

The air bags shall use a combination of high-pressure stored argon and oxygen with a pyrotechnic charge for initiation to inflate the bags remain inflated for several seconds.

The system shall be connected to the crash detection sensor that will also activate the driver and first officer integrated belt pretensioners if it detects a frontal crash.

A RollTek™ rollover occupant protection system shall be installed in the apparatus cab. The system shall include an integrated roll sensor (IRS) master module and a slave sensor in applicable configurations.

The IRS shall be a microprocessor-controlled solid-state sensing device that utilizes vehicle-specific calibrations to detect rollovers. The IRS shall be equipped with pyrotechnic loops for connection to the protective countermeasures which shall include seat integrated side roll airbags (SRA), integrated seat belt pretensioners, and air seat pull-downs (S4S), in applicable occupant seat positions.

The IRS shall continuously monitor the truck`s acceleration and angle, and upon detection of an imminent roll-over, shall activate protective countermeasures in a pre-programmed sequence. In addition, the IRS shall also act as a data recorder to record crash events for post-crash evaluation.

CAB FRONT FASCIA

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

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

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

CAB UNDERCOAT

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

CAB SIDE DRIP RAIL

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

CAB PAINT EXTERIOR

The cab exterior shall be painted dual color per customers specified paint color.

CAB PAINT PROCESS/MANUFACTURER

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

All metal surfaces on the cab shall be mechanically etched by sanding disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once all imperfections on the exterior

surfaces are removed and sanded smooth, body fillers shall be applied to the cab on all surfaces that require a critically aesthetic finish and sanded smooth.

The entire cab shall then be coated with a high quality base primer that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be sanding the cab to a smooth finish followed by sealing the seams with an automotive seam sealer. The minimum thickness of the primer coat after sanding shall be 2.50 mils with a maximum thickness of 5.00 mils.

The cab shall then be painted the specific color(s) designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on an emergency scene. The paint shall have a minimum thickness of 1.00 mils with a maximum of 4 mills, followed by a clear top coat with a minimum of 2.5 mils and a maximum of 3.5 mils. The entire cab shall then be baked to speed the curing process of the coatings.

CAB PAINT PRIMARY/LOWER COLOR

The primary/lower paint color shall be: customer will specify at time of order.

CAB PAINT WARRANTY

The cab paint warranty shall be determined once the customer chooses a paint manufacturer (1533).

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with a multi-tone silver gray texture finish.

CAB ENTRY DOORS

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

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

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

CAB ENTRY DOOR TYPE

All cab entry doors shall be full length in design to fully enclose the lower cab steps. Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.

CAB INSULATION

The cab ceiling and walls shall include a nonwoven polyester fiber insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

CAB STRUCTURAL WARRANTY

Purchaser shall receive a Cab Structure (Aluminum) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0602. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

CAB TEST INFORMATION

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

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

ELECTRICAL SYSTEM

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

VEHICLE DISPLAY

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

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

LOAD MANAGEMENT SYSTEM

The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.

DATA RECORDING SYSTEM

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

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

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system. The laptop connection shall be a panel mounted female type B USB connection point, remotely mounted in the left side foot well.

ACCESSORY POWER

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

EXTERIOR ELECTRICAL TERMINAL COATING

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

ELECTRICAL SYSTEM WARRANTY

Purchaser shall receive an Electrical System Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0202. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

ENGINE

The chassis engine shall be a Cummins L9 engine. The L9 engine shall be an in-line six (6) cylinder, four-cycle diesel-powered engine. The engine shall offer a rating of 380 horsepower at 2200 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1150-foot pounds of torque at 1200 RPM with 543 cubic inches (8.9 liters) of displacement.

The L9 engine shall feature a VGT™ Turbocharger, a high-pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2021-26 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CK-4 low ash engine oil which shall be utilized for proper engine lubrication.

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

CAB ENGINE TUNNEL

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

DIESEL PARTICULATE FILTER CONTROLS

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

ENGINE PROGRAMMING HIGH IDLE SPEED

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

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control which shall be pre-set to operate the engine at a specified RPM to increase alternator output if the system voltage drops to 12.5 volts. This device shall automatically operate only when the engine is running, the transmission is in neutral, and with the parking brake set. The automatic high idle will stay engaged for a minimum of ten (10) minutes and until the system, voltage has reached 13.0 volts. Application of the service brake will override the automatic high idle and reset timer. The vehicle shall be equipped with a high-idle speed virtual button on the vehicle display and control screen to activate/deactivate manual control only. It shall be pre-set so when activated, it will operate the engine at the specified RPM to increase alternator output. This device shall operate only when the engine is running, the transmission is in neutral, and with the parking brake set. When automatically engaged the high idle shall disengage when the operator depresses the brake

pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake pedal is released, or when the transmission is placed in neutral. Virtual control screen shall not override automatic high idle between voltage parameters during timed cycle. Display shall indicate when high idle is disabled, enabled, or active.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

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

AUXILIARY ENGINE BRAKE

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle's brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

AUXILIARY ENGINE BRAKE CONTROL

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

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

The compression brake shall be controlled through an on/off switch and a low/medium/high selector switch.

ELECTRONIC ENGINE OIL LEVEL INDICATOR

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

FLUID FILLS

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

ENGINE DRAIN PLUG

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

ENGINE WARRANTY

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

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

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

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator. This ember separator shall be designed to protect the downstream air filter from embers using a combination of unique flat and crimped metal screens packaged in a heavy duty galvanized steel frame. This multilayered screen shall trap embers and allow them to burn out before passing through the pack.

The engine air intake system shall also include an air cleaner mounted above the radiator. This air cleaner shall utilize a replaceable dry type filter element designed to prevent dust and debris from being ingested into the engine. A service cover shall be provided on the housing, reducing the chance of contaminating the air intake system during air filter service.

The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton fully variable type fan drive with SmartClutch J-1939 CAN controller.

The variable speed fan clutch only engages at the amount needed for proper cooling to facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail-safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure. The fan speed shall include a J-1939 CAN clutch controller to receive signal from the engine control module to activate at variable rates of speed. Variable speeds shall be set through thermostatic and engine speed signals to run as efficiently and quietly as required to maintain temperature.

ENGINE COOLING SYSTEM

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

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

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

The cooling system shall include a one piece injected molded polymer fan with a three (3) piece fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and rearward oriented sight glass to observe coolant in the system. A cold fill and observation line shall be included within the frame mounted translucent recovery bottle to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements and allows for expansion and recovery of coolant into a separate integral expansion chamber.

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

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

The radiator and charge air cooler shall be removable through the bottom of the chassis.

ENGINE COOLING SYSTEM PROTECTION

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

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant

shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

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

ELECTRONIC COOLANT LEVEL INDICATOR

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

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

ENGINE COOLANT OVERFLOW BOTTLE

A remote engine coolant overflow expansion bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overfill rather than allow the fluid to drain on the ground.

ENGINE EXHAUST SYSTEM

The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, and downpipe from the charge air cooled turbo. The single module shall include four temperature sensors, diesel particulate filter (DPF), urea dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be mixed and injected into the system through the DPF and SCR.

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

The single module after treatment through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system after treatment module shall be mounted below the frame in the outboard position.

DIESEL EXHAUST FLUID TANK

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

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

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

ENGINE EXHAUST ACCESSORIES

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

ENGINE EXHAUST WRAP

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

The exhaust flex joint shall not include the thermal exhaust wrap.

EMISSIONS SYSTEMS WARRANTY

Purchaser shall receive a Regulated Emissions Systems Five (5) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0140. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

TRANSMISSION

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

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

The transmission gear ratios shall be:

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

TRANSMISSION MODE PROGRAMMING

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

TRANSMISSION FEATURE PROGRAMMING

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

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

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

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

TRANSMISSION SHIFT SELECTOR

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

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

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

TRANSMISSION COOLING SYSTEM

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

TRANSMISSION DRAIN PLUG

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

TRANSMISSION WARRANTY

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

PTO LOCATION

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

DRIVELINE

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

MIDSHIP PUMP / GEARBOX

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

MIDSHIP PUMP / GEARBOX MODEL

The midship pump/gearbox provisions shall be for a Hale QMAX-XS pump.

MIDSHIP PUMP GEARBOX DROP

The Hale pump gearbox shall have an "L" (long) drop length.

MIDSHIP PUMP RATIO

The ratio for the midship pump shall be 2.28:1 (23).

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

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

PUMP SHIFT CONTROLS

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

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

PUMP SHIFT CONTROL PLUMBING

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

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Fleetguard FS20121 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

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

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

FUEL LINES

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

FUEL SHUTOFF VALVE

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

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

ELECTRIC FUEL PRIMER

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

FUEL TANK

The fuel tank shall have a capacity of fifty (50) gallons and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length.

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

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

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

FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 12 gauge aluminized steel. The exterior of the tank shall be powder coated black and then painted to match the frame components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum.

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

FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of ASTM A-36 hot-dip galvanized steel. The fuel tank straps shall include a natural galvanized finish.

FUEL TANK FILL PORT

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

FUEL TANK DRAIN PLUG

A 0.5 inch NPT magnetic drain plug shall be centered in the bottom of the fuel tank.

FRONT AXLE

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

FRONT AXLE WARRANTY

The front axle shall be warranted by Meritor for five (5) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

FRONT WHEEL BEARING LUBRICATION

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

FRONT SHOCK ABSORBERS

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

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

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

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

FRONT SUSPENSION

The front suspension shall include a ten (10) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds.

STEERING COLUMN/ WHEEL

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

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

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

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

POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 48-degrees to the left and 44-degrees to the right.

POWER STEERING GEAR

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

CHASSIS ALIGNMENT

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

REAR AXLE

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

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular

shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

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

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for five (5) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

VEHICLE TOP SPEED

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

REAR SUSPENSION

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

The rear suspension capacity shall be rated from 21,000 to 31,500 pounds.

TIRE INTERMITTENT SERVICE RATING

The chassis shall be rated using Intermittent Service ratings provided to the emergency vehicle market by the tire manufacturers as the basis for determining the maximum vehicle load and speed.

FRONT TIRE

The front tires shall be Michelin 315/80R-22.5 20PR "L" tubeless radial XZUS 2 regional tread.

The front tire stamped load capacity shall be 20,000 pounds per axle with a nominal speed rating of 65 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 21,400 pounds per axle with a maximum speed of 65 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall be 20,000 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR TIRE

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

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

The Michelin Intermittent Service Rating maximum load capacity shall be 29,020 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR AXLE RATIO

The rear axle ratio shall be 5.13:1.

TIRE PRESSURE INDICATOR

There shall be electronic chrome LED valve caps shipped loose for installation by the OEM which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation.

BRAKE SYSTEM

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

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

A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

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

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

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

FRONT BRAKES

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

REAR BRAKES

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

PARK BRAKE

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

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.

The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver.

REAR BRAKE SLACK ADJUSTERS

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

AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral 100 watt heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be located on the right hand frame rail forward of the front wheel behind the right hand cab step.

FRONT BRAKE CHAMBERS

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

REAR BRAKE CHAMBERS

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

AIR COMPRESSOR

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

AIR GOVERNOR

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

MOISTURE EJECTORS

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

AIR SUPPLY LINES

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

Push to connect type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

REAR AIR TANK MOUNTING

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

WHEELBASE

The chassis wheelbase shall be 190.00 inches.

REAR OVERHANG

The chassis rear overhang shall be 47.00 inches.

FRAME

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

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

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

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

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

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

FRAME PAINT

The frame shall be hot dip galvanized prior to assembly and attachment of any components. The components that shall be galvanized shall include:

- Main frame "C" channel or channels
- Front splayed rails and fish plates
- Cross members (excluding suspension cross members)
- Cross member gussets
- Fuel tank mounting brackets
- Fuel tank straps (unless material/finish is specified in 3130 subcat)
- Air tank mounting brackets (unless material/finish is specified in 3205, 3305, or 2232 subcat)
- Exhaust mounting brackets
- Air dryer bracket
- Air cleaner skid plate (if applicable)
- Radiator skid plate (if applicable)
- Battery supports
- Battery trays (unless material/finish is specified in 5106 subcat)
- Battery covers (unless material/finish is specified in 5107 subcat)

The frame parts which are not galvanized shall be powder coated prior to any attachment of components. Parts which shall be powder coated shall include but are not limited to:

- Bumper extensions
- Steering gear bracket
- Air tanks (unless color coded tanks are specified in 3205 subcat)

Other non-galvanized under carriage components which are received from the suppliers with coatings already applied shall include but are not limited to:

- Suspension components
- Front and rear axles

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

FRAME ASSEMBLY STRUCTURAL

Purchaser shall receive a Frame Assembly Structural Fifty (50) Years or 250,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0305. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRAME RAIL CORROSION

Purchaser shall receive a Frame Rail Corrosion (Zinc Plate and Powder Coat) Twenty Five (25) Years or 150,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0316. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRAME COMPONENTS CORROSION

Purchaser shall receive a Frame Components Corrosion (Zinc Plate) Twenty (20) Years or 132,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0314. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRONT BUMPER

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

FRONT BUMPER EXTENSION LENGTH

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

FRONT BUMPER SUCTION PROVISION

The bumper apron shall include a 6.00 inch stainless steel pipe intended for use as a suction intake for the pump. The suction pipe shall be routed from the right hand front bumper area to the area rear of the front axle near the back of the cab.

The front of the suction pipe shall be designed to extend 2.00 inches horizontally through the face of the bumper on the right hand side.

The forward end of the suction pipe shall be finished with a 6.00 inch National Pipe Thread (NPT). The rear of the suction shall include a Victaulic groove for connecting to the pump plumbing. The suction pipe shall also include a 0.50 inch NPT port intended as a primer assist connection.

The apparatus manufacturer shall plumb the suction pipe to the pump and shall provide all valves as required.

FRONT BUMPER APRON

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

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

FRONT BUMPER DISCHARGE

The chassis shall include frame mounted 2.00 inch diameter plumbed pipe intended for use as a discharge trash line. The discharge pipe shall be routed from the left hand front splay rail area behind the bumper to the area rear of the front axle, ahead of the battery box.

The discharge shall pipe shall be a, 2.00 inch stainless steel schedule 10 tube. The discharge shall include a Victaulic groove for connecting to the pump and discharge hose plumbing on each end of the tube.

The apparatus manufacturer shall plumb the discharge pipe to the pump and shall provide all valves as required.

FRONT BUMPER COMPARTMENT CENTER

The front bumper shall include a compartment in the bumper apron located in the center between the frame rails which may be used as a hose well. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape.

AIR HORN

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

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper fascia between the frame rails in the right and left outboard positions.

AIR HORN RESERVOIR

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

ELECTRONIC SIREN SPEAKER

There shall be one (1) Whelen Engineering Inc. model SP123BMC, 100 watt cast aluminum speaker provided. The speaker shall measure 7.25 inches tall X 9.25 inches wide X 5.25 inches deep. The speaker shall include a chrome grille.

ELECTRONIC SIREN SPEAKER LOCATION

The electronic siren speaker shall be located on the front bumper face in the center position between the frame rails.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty tow hooks, painted to match the frame components, shall be installed behind the front bumper in the forward position, bolted directly to the side of each chassis frame rail with grade 8 bolts.

CAB TILT SYSTEM

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

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

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

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

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

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

CAB TILT CONTROL RECEPTACLE

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

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

CAB TILT LOCK DOWN INDICATOR

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

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

CAB WINDSHIELD

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

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

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

GLASS FRONT DOOR

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

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

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

GLASS TINT FRONT DOOR

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

GLASS REAR DOOR RH

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

GLASS TINT REAR DOOR RIGHT HAND

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

GLASS REAR DOOR LH

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

GLASS TINT REAR DOOR LEFT HAND

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

GLASS SIDE MID RH

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

GLASS TINT SIDE MID RIGHT HAND

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

GLASS SIDE MID LH

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

GLASS TINT SIDE MID LEFT HAND

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

CABIN AIR FILTRATION SYSTEM

An Active Air Purification system will be installed in the cab. The system utilizes RGF's Photohydroionization® Cell (PHI-Cell®) technology which produces hydro-peroxides and hydroxide ions, reducing airborne mold, bacteria, viruses, and odors up to 99%.

The system shall include a stainless-steel housing approximately 7.50 inches high X 16.13 inches wide X 6.6 inches deep in a trapezoid shape and shall be located at the upper portion of the rear wall mounted in

a horizontal orientation. The system shall be 12V DC and shall be active either when the ignition power is on, or when the shoreline is connected.

CLIMATE CONTROL

The cab shall include a 57,500 BTU @ 425 CFM front overhead heater/defroster which shall be provided and installed above the windshield between the sun visors.

The cab shall also include a combination heater air-conditioning unit mounted on the engine tunnel. This unit shall offer eight (8) adjustable louvers, four (4) forward facing and four (4) rearward facing, a temperature control valve and two (2) blowers offering three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating.

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

The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aeroquip flexible hose with Aeroquip EZ clip fittings.

CLIMATE CONTROL DRAIN

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

CLIMATE CONTROL ACTIVATION

The heating and defrosting controls shall be located on the front overhead climate control unit. There shall be additional heating and air conditioning controls located on the engine tunnel mounted climate control unit.

A/C CONDENSER LOCATION

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

A/C COMPRESSOR

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

UNDER CAB INSULATION

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

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

The engine tunnel insulation shall measure approximately 0.30 inch thick including a multi-layer foil faced glass cloth and polyester fiber layer. The foil surface acts as protection against heat, moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by acrylic pressure sensitive adhesive.

INTERIOR TRIM FLOOR

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

INTERIOR TRIM

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

REAR WALL INTERIOR TRIM

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

HEADER TRIM

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

TRIM CENTER DASH

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.

TRIM LH DASH

The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 4.50 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

ENGINE TUNNEL TRIM

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

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of SAE 304 stainless steel with embossed perforations and diamond shaped cutout. The perforations and cutouts shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have drainage holes beneath the back of the step to allow debris and water to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 8 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08 inch thick 3003-H22 embossed aluminum tread plate.

UNDER CAB ACCESS DOOR

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

INTERIOR DOOR TRIM

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

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their department, city, township, or county.

CAB DOOR TRIM REFLECTIVE

The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the rear outer edge of the door. The lowest portion of each door skin shall

include a reflective tape chevron with red and white stripes and a Spartan logo. The chevron tape shall measure 6.00 inches in height.

INTERIOR GRAB HANDLE "A" PILLAR

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

INTERIOR GRAB HANDLE FRONT DOOR

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

INTERIOR GRAB HANDLE REAR DOOR

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

INTERIOR SOFT TRIM COLOR

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

INTERIOR TRIM SUNVISOR

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

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be gray in color.

CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted with multi-tone silver gray texture finish.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with multi-tone silver gray texture finish.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with multi-tone silver gray texture finish. Any accessory pods attached to the dash shall also be painted this color.

TRIM LH DASH INTERIOR PAINT

The left hand dash shall be painted with a multi-tone silver gray texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be painted with multi-tone silver gray texture finish.

DASH PANEL GROUP

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

SWITCHES CENTER PANEL

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

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

SWITCHES LEFT PANEL

The left dash panel shall include five (5) switches in a three (3) over two (2) staggered switch configuration. Two (2) rocker switches, one (1) headlight switch, one (1) windshield wiper/washer control switch and one (1) instrument lamp dimmer switch shall be provided.

A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SWITCHES RIGHT PANEL

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

SEAT BELT WARNING

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

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and

the park brake is released. Once activated, the visual indicators and applicable audible alarm shall remain active until all occupied seats have the seat belts fastened.

SEAT MATERIAL

The Bostrom Firefighter seats shall include a covering of extra high strength, wear resistant fabric made of durable low seam Durawear Plus™ ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus™ meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.
If applicable, Theatre style seats located in the cab shall be high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

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

SEAT BACK LOGO

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

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom 500 Series Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

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

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

SEAT BACK DRIVER

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

SEAT MOUNTING DRIVER

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

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with the IMMI 4Front and RollTek™ Systems which shall secure belted occupants and increase the survivable space within the cab. The 4Front and RollTek™ Systems shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, and rollover events.

The Driver's seating area protection shall include:

- Drivers airbag **DAB** - inflates a steering wheel airbag to protect the head and neck of the driver.
- Driver's knee airbag **DKAB** - inflating knee bolster airbags to protect the knees.
- Integrated roll sensor **IRS** - detects an imminent rollover, activates protective devices and records crash events.
- Integrated belt pretension **IBP -** device for mechanical and/or electrical seats tightens the seat belt, securing driver in seat and positions driver for contact with seat integrated head cushion side roll airbag.

Inflatable head cushion seat integrated side roll airbag **SRA** - protects driver's head/neck and shields driver from dangerous surfaces.

SEAT OFFICER

The officer's seat shall be a H.O. Bostrom 500 Series Sierra seat model. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

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

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

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

SEAT BACK OFFICER

The officer's seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

SEAT MOUNTING OFFICER

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

OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with the IMMI 4Front and RollTek™ Systems which shall secure belted occupants and increase the survivable space within the cab. The 4Front and RollTek™ Systems shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, and rollover events.

The Officer's seating area protection shall include:

- Officer's knee airbag **OKAB** - inflating knee bolster airbags to protect the knees.

- Integrated roll sensor **IRS** - detects an imminent rollover, activates protective devices and records crash events.

- Integrated belt pretension **IBP -** device for mechanical and/or electrical seats tightens the seat belt, securing officer in seat and positioning officer for contact with seat integrated head cushion side roll airbag.

- Inflatable head cushion seat integrated side roll airbag **SRA** - protects officer's head/neck and shields officer from dangerous surfaces.

POWER SEAT WIRING

The power seat or seats installed in the cab shall be wired directly to battery power.

SEAT BELT ORIENTATION CREW

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

SEAT REAR FACING OUTER LOCATION

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

SEAT CREW REAR FACING OUTER

The crew area shall include a seat in the rear facing outboard position which shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be spring load hinged and compact in design for additional room. The seat shall include a "Fold and Hold" feature so that the cushion shall remain in the seated position and simply touched to flip up.

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

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

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

SEAT BACK REAR FACING OUTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

SEAT MOUNTING REAR FACING OUTER

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

OCCUPANT PROTECTION RFO

The rear facing outer seat position(s) shall be equipped with the RollTek™ System which shall secure belted occupants and increase the survivable space within the cab. The RollTek™ System shall deploy integrated systems to protect against injuries in rollover events.

The rear facing outer seat position(s) protection shall include:

- Integrated roll sensor **IRS** - detects an imminent rollover, activates protective devices and records crash events.

- Integrated belt pretension **IBP -** device for flip-up (non-theatre) and fixed mechanical seats tightens the seat belt, securing occupant in seat and positioning occupant for contact with seat integrated head cushion side roll airbag.

Inflatable head cushion seat integrated side roll airbag **SRA** - protects occupant’s head/neck and shields occupant from dangerous surfaces.

OCCUPANT PROTECTION FFC

The forward facing center seat positions shall be equipped with the RollTek™ rollover occupant protection system which shall secure occupants, increase the survivable space within the cab and protect against head/neck injuries in the event of a rollover accident.

The system shall function using a microprocessor-controlled, solid-state sensing device which, when the system detects a side roll shall provide instantaneous occupant protection (less than 0.3 seconds from trigger to total deployment) by automatically initiating the following sequence:

1. The seat belt shall tighten around the occupant.

System Components Shall Include:

Integrated Roll Sensor **IRS** - detects an imminent rollover, activates protective devices and records crash events.

Integrated Belt Pretension **IBP** with flip-up (non theatre) and fixed mechanical seats - tightens the seat belt around occupant, securing occupant in seat.

Integrated Gas Pretension **IGP** with flip-up theatre style seats - tightens the seat belt around occupant, securing occupant in seat.

CAB FRONT UNDERSEAT STORAGE ACCESS

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

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have a multi-tone silver gray texture finish.

WINDSHIELD WIPER SYSTEM

The cab shall include a triple arm linkage wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers; each shall be affixed to a radial arm. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

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

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of a fiber reinforced plastic composite with a black matt finish.

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

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

DOOR LOCKS

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

GRAB HANDLES

The cab shall include one (1) 18.00 inch three-piece knurled aluminum anti-slip exterior grab handle behind each cab door. The Hansen Anti-Slip Rails shall be mounted in bright anodized aluminum 4000 Series II stanchions, complete with weep holes to prevent the buildup of moisture.

The grab rails shall include red reflective tape.

LIGHTED GRAB HANDLES

The grab rails shall include a 12 volt, 17.00 inch long clear LED light to provide an increased margin of safety for night time cab entry and egress.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style single vision mirror heads model 613275 shall be provided and installed on each of the front cab doors.

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

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an 8.00 inch convex mirrors with a stainless steel back, model 980-4, installed below the flat glass to provide a wider field of vision. The flat mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The convex mirrors shall be manually adjustable. The flat mirror glass shall be heated for defrosting in severe cold weather conditions.

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

REARVIEW MIRROR HEAT SWITCH

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

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Fender shall consist of an inner liner 16.00 inches wide made of ABS composite and an outer fenderette 3.50 inches wide made of SAE 304 polished stainless steel.

MUD FLAPS FRONT

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

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include three (3) Spartan emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on each of the cab sides.

CAB EXTERIOR MODEL NAMEPLATE

The cab shall include “Metro Star” nameplates on the front driver and officer side doors.

IGNITION

A master battery system with a keyless start ignition system shall be provided. There shall be a three-position rocker switch with off, battery, and ignition positions as well as a stainless-steel etched engine start push-button. The engine start button shall include an illuminated LED halo ring. Both switches shall be mounted to the left of the steering wheel on the dash.

The engine start switch shall only operate when the master battery and ignition switch is in the “ignition” position.

BATTERY

The single start electrical system shall include six (6) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

BATTERY TRAY

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

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

BATTERY BOX COVER

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

BATTERY CABLE

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

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR

The charging system shall include a 430 amp Delco Remy 55SI 12 volt alternator. The alternator shall include a self-exciting integral regulator.

STARTER MOTOR

The single start electrical system shall include a Delco brand starter motor.

BATTERY CONDITIONER

A Kussmaul Auto Charge Chief 4012 battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 20 amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position and shall include a battery temperature sensor.

BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner display with a digital status center display shall be integrated into the electrical inlet.

ELECTRICAL INLET LOCATION

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

ELECTRICAL INLET

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

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

Amp Draw Reference List:
Kussmaul 40 LPC Charger - 5 Amps
Kussmaul 40/20 Charger - 8.5 Amps
Kussmaul 80 LPC Charger - 13 Amps

Kussmaul EV-40 - 6.2 Amps
Blue Sea P12 7532 - 7.5 Amps
Iota DLS-45/IQ4 - 11 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps
120V Dometic HVAC - 15 Amps

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a yellow cover.

HEADLIGHTS

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels. Each lamp shall include a heating system that de-ices the headlight.

HEADLIGHT LOCATION

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

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00 inch X 6.00 inch amber LED turn signals which shall be installed in a chrome radius mount housing above and outboard of the front warning and head lamps.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) Tecniq S170 LED side marker lights which shall be provided just behind the front cab radius corners. The lights shall be amber with chrome bezels.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) Tecniq S170 LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level. The lights shall be amber with chrome bezels.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled through a rocker switch within easy reach of the driver. There shall be a dimmer switch within easy reach of the driver to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights when the ignition switch is in the "On" position and the parking brake is released.

INTERIOR OVERHEAD LIGHTS

The cab shall include a LED dome lamp located over each door. The lights shall include push switches on each lamp to activate both the clear and red portions of the light individually.

INTERIOR OVERHEAD LIGHTS ACTIVATION

The clear portion of each lamp shall be activated by opening the respective door and via the multiplex display.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar shall be provided and installed by the chassis manufacturer. The light bar installation shall include a lowered mounting that shall place the light bar just above the junction box and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR MODEL

The cab shall be provided with one (1) Whelen model F4N72 light bar. The light bar shall be 72.00 inches in length and feature eighteen (18) customizable pods.

See the light bar layout for specific details.

LIGHTBAR SWITCH

The light bar shall be controlled by a virtual button on the vehicle display and control screen. This button shall be clearly labeled for identification.

FRONT SCENE LIGHTS

The front of the cab shall include a Whelen Pioneer model PCH2 contour roof mount scene light installed on the brow of the cab.

Each 150 watt lamp head shall incorporate a 12 volt DC Super-LED combination flood/spot light installed in a die-cast aluminum housing. Each lamp head shall use a collimator/metalized redux spot/flood reflector assembly with Proclera™ silicone optics and a clear non-optic polycarbonate lens. The lens/reflector assembly shall utilize a liquid injected molded silicone gasket to be resistant to water, moisture, dust, and other environmental conditions. The PCH2 shall be vibration resistant. The Pioneer PC boards shall be conformal coated for additional protection. Each combination flood/spot light lamp head shall draw 13.0 amps in spotlight mode and generate 17,750 lumens total. Each lamp head shall measure 4.25 inches in height X 14.00 inches in width. The lamp heads and brackets shall be powder coated white.

FRONT SCENE LIGHT LOCATION

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

FRONT SCENE LIGHTS ACTIVATION

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

SIDE SCENE LIGHTS

The cab shall include two (2) Whelen Pioneer model PCPSM1C LED surface mount lights installed one (1) on each side of the cab.

The PCPSM1C configuration shall consist of twelve (12) white Super-LEDs for the spot light with a specialized spot reflector on the bottom, twenty-four (24) white Super-LEDs in the flood light with a clear optic collimator/metalized reflector assembly on the top, and a clear non-optic polycarbonate lens. Each lamp head shall draw 6.0 amps and generate 7,800 lumens. Each lamp head shall measure 6.37 inches in height X 8.97 inches in width. Each lamp head housing shall be chrome plated.

SIDE SCENE LIGHT LOCATION

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

SIDE SCENE ACTIVATION

The scene lights shall be activated by two (2) virtual buttons on the vehicle display and control screen(s), one (1) for each light.

GROUND LIGHTS

Each door shall include a Strip LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

GROUND LIGHTS

The ground lighting shall be activated when the parking brake is set, by the opening of the door on the respective cab side, and through a virtual button on the vehicle display and control screen.

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a Tecniq T44 LED light which shall activate with the opening of the respective door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

INTERMEDIATE STEP LIGHTS

The intermediate step well area at the front doors shall include a TecNiq D06 LED light within a chrome housing. The front egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with entry step lighting.

ENGINE COMPARTMENT LIGHT

There shall be a LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall activate automatically when the cab is tilted.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red TecNiq K50 LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be located centered left to right for greatest visibility.

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

MASTER WARNING SWITCH

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

HEADLIGHT FLASHER

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

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

HEADLIGHT FLASHER SWITCH

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

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel

INBOARD FRONT WARNING LIGHTS COLOR

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

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

OUTBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the outboard position shall be red.

FRONT WARNING SWITCH

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

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red.

INTERSECTION WARNING LIGHTS LOCATION

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

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.

SIDE WARNING LIGHTS COLOR

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

SIDE WARNING LIGHTS LOCATION

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

SIDE AND INTERSECTION WARNING SWITCH

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

INTERIOR DOOR OPEN WARNING LIGHTS

The interior of each door shall include one (1) red 4.00 inch diameter Tecniq T40 LED warning light located on the door panel. Each light shall activate with a flashing pattern when the door is in the open position to serve as a warning to oncoming traffic.

SIREN CONTROL HEAD

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

STEERING WHEEL HORN BUTTON SELECTOR SWITCH

A virtual button on the Vista display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button.

AUDIBLE WARNING LH FOOT SWITCH

Two (2) foot actuated switches shall be supplied for installation in the front section of the cab for driver actuation. One (1) switch shall be wired to actuate the air horn(s) and one (1) switch the mechanical siren(s).

AIR HORN FOOT SWITCH LH

The air horn foot switch shall be a Linemaster model 491-S.

AIR HORN FOOT SWITCH LH LOCATION

The air horn foot switch shall be located on the left hand side accessible to the driver between the steering column and the door.

AIR HORN FOOT SWITCH LH POSITION

The air horn foot switch shall be positioned inboard of any other foot switch, if applicable.

AUDIBLE WARNING LH FOOT SWITCH BRACKET

A 30.00 degree angled foot switch bracket, wide enough to accommodate (2) foot switches, shall be installed outboard of the steering column for specified driver accessible foot switch activations.

AUDIBLE WARNING RH FOOT SWITCH

A foot switch wired to actuate the mechanical siren(s) shall be supplied for installation in the front section of the cab for officer actuation.

AIR HORN AUXILIARY ACTIVATION

The air horn activation shall be accomplished by a black momentary push button on the switch panel. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

BACK-UP ALARM

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

INSTRUMENTATION

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

A twenty eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th tank level.

One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating

critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.

The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:

RED INDICATORS

Stop Engine - indicates critical engine fault
Air Filter Restricted - indicates excessive engine air intake restriction
Park Brake - indicates parking brake is set
Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened
Low Coolant - indicates critically low engine coolant
Cab Tilt Lock - indicates the cab tilt system locks are not engaged.

AMBER INDICATORS
Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault
Check Engine - indicates engine fault
Check Transmission - indicates transmission fault
Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault
High exhaust system temperature – indicates elevated exhaust temperatures
Water in Fuel - indicates presence of water in fuel filter
Wait to Start - indicates active engine air preheat cycle
Windshield Washer Fluid – indicates washer fluid is low
DPF restriction - indicates a restriction of the diesel particulate filter
Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator
Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur.
SRS - indicates a problem in the supplemental restraint system
Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring attention.

GREEN INDICATORS
Left and Right turn signal indicators
ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle - indicates engine high idle is active.
Cruise Control - indicates cruise control is enabled
OK to Pump - indicates the pump is engaged and conditions have been met for pump operations
Pump Engaged - indicates the pump transmission is currently in pump gear
Auxiliary Brake - indicates secondary braking device is active

BLUE INDICATORS
High Beam indicator

AUDIBLE ALARMS
Air Filter Restriction
Cab Tilt Lock
Check Engine
Check Transmission
Open Door/Compartment
High Coolant Temperature
High or Low System Voltage
High Transmission Temperature
Low Air Pressure
Low Coolant Level
Low DEF Level
Low Engine Oil Pressure
Low Fuel
Seatbelt Indicator
Stop Engine
Water in Fuel
Extended Left/Right Turn Signal On
ABS System Fault

BACKLIGHTING COLOR

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

CAMERA REAR

One (1) Audiovox Voyager heavy duty box shaped HD camera shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle.

The camera system shall include a one-way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver. The rear camera display shall activate when the vehicle's transmission is placed in reverse.

CAMERA DISPLAY

The camera system shall be wired to a single vehicle display and control screen located on the driver's side dash. The camera system display can be activated through the vehicle display and control screen.

CAMERA SPEAKER

The rear camera shall be wired to speaker(s) in the cab and shall audible to the driver and officer. There shall be a virtual button provided on the Vista display and control panel to deactivate the speaker(s).

COMMUNICATION ANTENNA

An antenna base, for use with an NMO type antenna, shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna base shall be an Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be chassis builder supplied.

COMMUNICATION ANTENNA CABLE ROUTING

The antenna cable shall be routed from the antenna base mounted on the roof to the area behind and underneath the right hand front seat.

FIRE EXTINGUISHER

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

DOOR KEYS

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

WARRANTY

Purchaser shall receive a Custom Chassis Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0102. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

CHASSIS OPERATION MANUAL

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

ENGINE AND TRANSMISSION OPERATION MANUALS

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

(1) Hard copy of the Engine Operation and Maintenance manual with digital copy

(1) Digital copy of the Transmission Operator’s manual

(1) Digital copy of the Engine Owner’s manual

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

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

SALES TERMS

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

DRIVELINE LAYOUT CONFIRMATION

During the design phase of the chassis the Spartan Chassis driveline engineer shall submit the driveline layout to an OEM engineer to review the chassis design for any potential problems integrating the OEM body to the chassis. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released.

EXHAUST HEAT SHIELD

The chassis horizontal exhaust pipe shall be equipped with a stainless steel heat shield to protect the body compartments.

The exhaust pipe shall discharge engine exhaust to the right side of the apparatus.

MUDFLAPS

Heavy-duty black rubber mudflaps shall be provided behind the front tires.

Black, anti-sail mudflaps shall be installed behind the rear wheels.

REAR TOW BAR

A two inch diameter, solid steel bar shall be suspended approximately 28" below the top of the rear chassis frame rail.

The tow bar shall be attached to the frame rail at each side using properly reinforced channel supports.

Tow bars that are attached to both the frame rails and the apparatus body will not be acceptable, due to undue stresses on the body, caused when the chassis frame flexes.

2" WINCH RECEIVER - REAR

A 2" receiver shall be mounted at the rear of the apparatus. The hitch shall be properly supported off the chassis frame rails. 12 volt wiring with a plug will be provided for powering the winch.

2" WINCH RECEIVER - FRONT & REAR

Two (2) 2" receivers shall be mounted, one (1) at the front of the apparatus and one (1) at the rear of the apparatus. 12 volt wiring with a plug will be provided at each receiver for powering the winch.

HELMET HOLDERS

The required helmet holders will be supplied with the custom chassis.

FUEL FILL

The fuel fill for the custom chassis shall be located in the left side rear fender area, and shall have a painted stainless steel door, labeled: "DIESEL FUEL ONLY".

CAB TILT CONTROL

A cab-tilt pendant control shall be provided and installed on the right side of the apparatus. The pendant shall be located directly behind the upper auxiliary pump access panel.

A cab tilt instruction plate shall be located as close as possible to the control pendant for ease of operation.

PUMP CONTROL

Provisions shall be made for placing the pump drive system in operation, using controls and switches that are identified, and within convenient reach of the operator.

A "PUMP ENGAGED" indicator shall be provided in the driving compartment and on the operator's panel to indicate that the pump shift process has been successfully completed. An "OK TO PUMP" indicator shall be provided in the driving compartment to indicate that the pump is engaged, the chassis transmission is in pump gear, and the parking brake is engaged.

The fire pump-shift system shall be equipped with a means to prevent unintentional movement of the control device from its set position. The system shall include a nameplate, indicating the chassis transmission shift selector position to be used for pumping, and located so that it can be easily read from the driver's position.

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

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

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