

**SPECIFICATIONS**

**FOR**

**BARBOURVILLE**

**ON A**

**MIDI-PUMPER**

## **INFORMATION FOR CONTRACTORS**

Sealed bids are requested from reputable companies who construct fire apparatus vehicles. The contractor must have a facility that will house the apparatus in an enclosed building during the construction of the unit. All bids shall include all necessary labor, equipment and material for the fire apparatus and other equipment as outlined in the following specifications.

Bids will be addressed in accordance with the instructions provided above. The type of bid, the date and the bid opening time shall be stated on the front of the bid envelope.

It is the intent of these specifications to describe a midi-pumper, in sufficient detail to enable to secure bids on comparable equipment. The equipment shall be new, unused, the manufacturers latest production and that which is furnished to fire department in general.

Only manufacturers with an accomplished background in Fire Apparatus building shall be considered. Satisfactory evidence of their ability to construct Fire Apparatus, and the apparatus specified shall be stated. The location of the factory where the apparatus is manufactured shall be identified. The manufacturer shall also state the number of years they have been building fire apparatus and similar vehicles. The factory location must be located within the continental United States.

Contractors must construct the entire unit, less the chassis, but including the body within their own premises. The contractor must own the rights to the respective extrusions used in the construction of the body. Bodies manufactured by other body companies will not be acceptable and be cause for rejection of bid.

This is an engineer, design, construct and deliver type specification and is not the intention of this agency to write out vendors or manufacturers of similar or equal equipment of the types specified. It should be noted however, that this specification is written around specific needs of this department. With this intent to standardize certain components, therefore in numerous places we have named specific brands of components. This has been done to establish a certain standard of quality. Other brands will be accepted providing the vendor note in the bid that the particular brand meets or exceeds the quality of the actual brand that the specifications call for.

Submit only one (1) bid that meets or exceeds the minimum specifications herewith. No substitutes, stock units, or alternates will be permissible unless such units are requested later in the specifications. If this is done, then the bidder will be automatically disqualified.

This apparatus shall conform to the National Fire Protection Association (NFPA.) Pamphlet No.1901, 1999 edition.

The emergency vehicle, chassis, pump, module body, equipment, devices, and electronic equipment to be delivered under this contract shall be standard specification. The unit shall comply with all Federal Motor Vehicle Safety Standards (FMVSS), and Federal regulation applicable or specified for the year of manufacture. The chassis, components and optional items shall be represented in the manufacturers current technical data. Materials used in the construction shall be new and not less than the quality conforming to current engineering and manufacturing practices. Materials shall be free from defects and suitable for the services intended.

All bids must be signed. Failure to do so shall cause the bid to be "No-Responsive" and rejected.

The Fire Department reserves the right to reject any or all bids, and also the right to reject the bid or bidder who, in judgment of the buying authority is not in a position to perform the duties within the contract. The competency and responsibility of the bidder will be considered in making the award. These specifications, together with any other documents required herein, shall be included in the final contract. Each bidder shall also submit a copy of his proposed contract form.

It shall be the responsibility of the bidder to assure that their proposal arrives at the proper location by time and date indicated. Late proposals, telegrams, facsimile, or telephone bids will not be considered. Bids will not be considered from firms, individuals and or same owners of separate companies submitting more than one bid. If a vendor represents more than one fire apparatus manufacturer, they will only bid the top of the line apparatus that meets purchasers specifications.

Only prices that have been type written in numerals will be accepted by purchaser. Failure to submit a bid with type written numerals will be cause to reject the bid, deemed as irregular and disqualified from consideration.

THE PURCHASER WILL NOT ACCEPT ANY BIDS FROM WHICH DO NOT MEET THESE SPECIFICATIONS, AND WILL HAVE SOLE DISCRETION TO DEEM WHICH BID IS IN THE BEST INTEREST OF THE PURCHASER.

The fire apparatus and equipment to be furnished in meeting these specifications must be the product of an established and reputable fire apparatus manufacturer of twenty (20) years or more. A list of no less than five (5) delivered units (completed apparatus) which have been built by their company. This list shall include not only the companies latest produced units, but also some of its earliest units, to determine the manufacturers reliability, credibility, and its response to service (post delivery).

The general construction of the apparatus shall give due consideration to the nature and distribution of the load to be sustained and the general character of the service to which the apparatus is to be subjected when placed in service. The general design and construction shall be of the latest modern type, remaining fully modular for the ability of body transfer to another chassis, without cutting or welding.

Each bidder must submit a detailed proposal, which accurately specifies the construction method to be used in the apparatus. The purchaser will utilize this proposal to compare the unit proposed with their specifications. To facilitate comparison, all bid proposal specifications shall be submitted in the same sequence as the advertised specification. Any Bidder who fails to submit a set of construction specifications, or photocopies and submits another's specifications as their own construction details will not be considered.

These specifications are based on design and performance criteria, which have been developed by the fire department as a result of extensive research and careful analysis. Subsequently these specifications reflect the only type of fire apparatus that is acceptable at this time. Therefore major exceptions to the specifications will not be accepted.

Deviations from specifications, no matter how slight, shall be clearly explained on a separate cover sheet entitled "EXCEPTIONS TO SPECIFICATIONS". Exceptions and variations (any and all) to these specifications must be set forth on separate sheets, indicating or referencing the page number(s) to the purchasers specifications. These exceptions must be submitted with bid. Bids deemed as taking total exception to these published specifications shall result in immediate rejection of the bid.

Proposals that are found to have deviations from the specifications without listing them on an "EXCEPTIONS TO THE SPECIFICATIONS" sheet will be rejected. NO EXCEPTIONS!

No prototype apparatus will be considered, and all design, operational, and material features must fully comply with the State, and Federal Motor Vehicle Safety Standards.

Each bid shall be in strict compliance with the purchaser's specifications and shall be accompanied by a detailed description of the work to be performed. Minor details of construction regarding design and material, where not otherwise specified, are to be left to the discretion of the bidder, and will be their sole responsibility. Bidder shall acknowledge receipt of all addendum with bid. The detailed specification section of the specifications shall be adhered to completely. Then it is to be certified by an officer of the manufacturing company and not a sales representative. NO EXCEPTIONS!

Organizations or individuals submitting bids must represent directly the company that will be providing the labor and materials for the construction.

All work performed by the contractor shall be guaranteed by the successful bidder to be fabricated and assembled in a first class workman like manor, and of good quality material.

Bid prices should not include tax. We shall certify tax exemption required.

The apparatus, plating, paint and all items furnished on the apparatus shall be guaranteed by the contractor for a period of one year from acceptance. It shall warrant against defective workmanship and materials at no cost to us. This covers all equipment except maintenance items such as tires, lamps, and filters.

Payment terms must be included with the proposal.

A contract will not be awarded until we have satisfied ourselves that the successful bidder is familiar with this class of equipment, meets the previously described criteria, has the necessary capital, facilities and tools to manufacture the same.

Information, which is incomplete, evasive or of general nature shall be considered as grounds for rejection of the bid.

In making the award of this contract, we shall consider both the prices offered and the qualifications of the bidder, all as indicated within the proposal.

We reserve the right to waive minor informalities and reject any or all bids and/or to accept that proposal which in our opinion is deemed most advantageous from a stand point of design, service and other special features and are not necessarily bound to accept the low bid.

Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the removal of major component parts for service and/or repair. This includes, but is not limited to, individual body compartments, doors, pan braces, body subframe, body side's beavertails, etc.

To insure full dealer support for the service after the sale, the selling dealer must be capable of providing factory service when required.

The successful bidder shall maintain an established service center and parts depot capable of satisfying the warranty service requirements and parts requirements of the vehicle being purchased.

The successful bidder must have 24-hour in-house service capabilities to keep down time to a minimum.

The bidder must state location of its authorized service center. This service center must have a staff of factory-trained mechanics, well versed in all aspects of service for all major components of the apparatus. The service center must be within a reasonable distance of purchaser. The successful bidder will assume all costs of any services not within reasonable distance as determined by the fire chief. The successful bidder must also maintain a separate facility at the manufacturing site, in order to satisfy the need for possible major emergency service or repair / collision work.

All bidders responding to these specifications shall submit the proper Certificate of Insurance. The Certificate shall certify that the Manufacture of the vehicle bid has, in force, Product Liability Insurance of a minimum of five million dollars (\$5,000,000.).

The bidder, if the bidders proposal is accepted by the purchasing party, they shall defend against any and all suits, assume all liability for the use of any patented process, advice, or article forming a part of any apparatus of any appliance furnished under contract.

The successful bidder will be responsible for conducting all road tests as specified by the NFPA.. The successful bidder shall also conduct a pump test on the completed unit and supply proper documentation upon delivery of unit. Copies of all testing records shall be forwarded to the fire department prior to the acceptance of the apparatus. The apparatus must pass all tests in order to be considered acceptable.

Upon acceptance, a factory trained instructor shall instruct the fire department personnel on the operation and maintenance of the unit.

Two copies of a complete operation and maintenance manual, covering the completed apparatus as delivered, including, but not limited to the chassis, pump, wiring diagrams, lubrication charts, and fire fighting equipment.

In the event that there are any questions concerning these specifications, the bidder is directed to contact, in writing.

\_\_\_\_\_(NAME)\_\_\_\_\_  
\_\_\_\_\_(FIRE DEPARTMENT)\_\_\_\_\_  
\_\_\_\_\_(ADDRESS)\_\_\_\_\_  
\_\_\_\_\_(PHONE)\_\_\_\_\_  
\_\_\_\_\_(FAX)\_\_\_\_\_

**APPROVAL DRAWINGS**

There shall be a complete set of drawings that are designed from the specifications and/or any change orders signed by the purchaser before construction begins. These drawings shall indicate the chassis make and model, location of lights, siren, horns, compartments and all major components of the unit. The signed drawings will become part of the contract documents. NO EXCEPTIONS.

**LIMITED WARRANTY**

The body manufacturer shall warrant the new apparatus for a period of twelve (12) months or 12,000 miles (whichever occurs first) from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free from defects in material and workmanship that may appear under normal use and service within the warranty period.

A copy of the warranty shall be supplied with the bid.

### **PAINT WARRANTY**

The body manufacturer shall warrant the new apparatus paint finish for a period of seven (7) years or 84,000 miles (whichever occurs first) from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free from peeling, cracking, loss of gloss caused by cracking, and any paint failure caused by defective finishes as determined by the manufacturer under normal use and service within the warranty period.

A copy of the warranty shall be supplied with the bid.

### **ELECTRICAL WARRANTY**

The body manufacturer shall warrant the new apparatus electrical system for a period of five(5) years or 50,000 miles (whichever occurs first) from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free from defects in the electrical harness and connections under normal use and service within the warranty period. A copy of the warranty shall be supplied with the bid.

### **BODY STRUCTURAL WARRANTY**

The body manufacturer shall warrant the new apparatus for structural integrity for a period of ten (10) years from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free all structural defects of both material and workmanship that may appear under normal use and service within the warranty period. A copy of the warranty shall be supplied with the bid.

### **CHASSIS**

#### **Model Profile**

#### **2008 Diamond SPEC™ 4300 SFA 4X2 CONVENTIONAL CAB**

APPLICATION:	Fire/Pumper (Emergency)
MISSION:	Requested GVWR: 29000. Calc. GVWR: 29000 Calc. Start / Grade Ability: 29.30% / 2.49% @ 55 MPH Calc. Geared Speed: 85.8 MPH
FUEL ECONOMY:	9.92 MPG @ 55 MPH
DIMENSION:	Wheelbase: 228.00, CA: 109.10, Axle to Frame: 75.00
ENGINE, DIESEL:	{International MaxxForce 9} 50 State, 300HP, 800 lb-ft Torque @ 1200 RPM, 2200 RPM Governed Speed, # 2 Bell Housing
TRANSMISSION, AUTOMATIC:	{ALLISON 3000EVS_P} 4th Generation Controls; Close Ratio, 5-Speed; With Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, Max. GVW N/A
CLUTCH:	Omit Item (Clutch & Control)
AXLE, FRONT DRIVING:	{Meritor MX-10-120} Single Reduction, 10,000-lb Capacity
AXLE, REAR, SINGLE:	{Meritor RS-19-145} Single Reduction, Standard Track, 19,000-lb Capacity, With 190 Wheel Ends Gear Ratio: 4.11
CAB:	Conventional 2 door
TIRE, FRONT:	(2) 11R22.5 G164 RTD M+S (GOODYEAR) 499 rev/mile, load range H, 16 ply
TIRE, REAR:	(4) 11R22.5 G164 RTD M+S (GOODYEAR) 499 rev/mile, load range H, 16 ply
SUSPENSION, RR, SPRING, SINGLE:	Vari-Rate; 20,000-lb Capacity, With 4500 lb Auxiliary Rubber Spring
PAINT:	Cab Schematic 100GM Location 1: 2602, Red (Prem) Chassis Schematic N/A

Base Chassis, Model 4300 SBA 4X2 with 151.00 Wheelbase, 84.00 CA, and 57.00 Axle to Frame.

- 1570 TOW HOOK, FRONT (2) Inside Rail, Frame Mounted.
- 1CAE FRAME RAILS Heat Treated Alloy Steel (120,000 PSI Yield); 10.125" x 3.580" x 0.312" (257.2mm x 90.9mm x 8.0mm); 420.0" (10668mm) Maximum OAL
- 1LNN BUMPER, FRONT Full Width, Aerodynamic, Chrome Plated Steel; 0.142" Material Thickness
- 1WEJ WHEELBASE RANGE 199" (505cm) Through and Including 254" (645cm)
- 2ADD AXLE, FRONT NON-DRIVING {International I-120SG} I-Beam Type, 12,000-lb Capacity
- 3ADC SUSPENSION, FRONT, SPRING Parabolic, Taper Leaf; 12,000-lb Capacity; With Shock Absorbers  
Includes  
: SPRING PINS Rubber Bushings, Maintenance-Free
- 4091 BRAKE SYSTEM, AIR Dual System for Straight Truck Applications  
Includes: AIR COMPRESSOR AIR SUPPLY LINE International Engines, Naturally-Aspirated  
: BRAKE CHAMBERS, SPRING (2) Rear Parking  
: BRAKE LINES Color Coded Nylon  
: DRAIN VALVE Twist-Type  
: DUST SHIELDS, FRONT BRAKE  
: DUST SHIELDS, REAR BRAKE  
: GAUGE, AIR PRESSURE (2) Air 1 and Air 2 Gauges; Located in Instrument Cluster  
: PARKING BRAKE VALVE Color-Coded Yellow Knob, Located on Instrument Panel  
: SLACK ADJUSTERS, FRONT Automatic  
: SLACK ADJUSTERS, REAR Automatic  
: SPRING BRAKE MODULATOR VALVE
- 4732 DRAIN VALVE {Berg} Manual; With Pull Chain, for Air Tank
- 4AZJ AIR BRAKE ABS {Bendix AntiLock Brake System} Full Vehicle Wheel Control System (4-Channel) With Automatic Traction Control
- 4EBS AIR DRYER {Bendix AD-9} With Heater
- 4JBG BRAKES, FRONT, AIR CAM S-Cam; 15.0" x 4.0"; Includes 20 Sq. In. MGM Long Stroke Brake Chambers
- 4NCE BRAKES, REAR, AIR CAM 16.5" x 7.0"; Includes MGM TR3030 Long Stroke Brake Chamber and Heavy Duty Spring Actuated Parking Brake
- 4SBC AIR COMPRESSOR {Bendix Tu-Flo 550} 13.2 CFM Capacity
- 5708 STEERING COLUMN Tilting
- 5CAL STEERING WHEEL 2-Spoke, 18" Diam., Black
- 5PSA STEERING GEAR {Sheppard M-100} Power
- 7BDK EXHAUST SYSTEM Single, Horizontal, After treatment Device Frame Mounted Outside Left Rail Back of Cab; Includes Horizontal Tail Pipe

8000 ELECTRICAL SYSTEM 12-Volt, Standard Equipment 0/0 0  
Includes  
: BATTERY BOX Steel with Fiberglass Cover; Mounted Right Side, Back of Cab  
: DATA LINK CONNECTOR For Vehicle Programming and Diagnostics In Cab  
: FUSES, ELECTRICAL SAE Blade-Type  
: HAZARD SWITCH Push On/Push Off, Located on Top of Steering Column Cover  
: HEADLIGHT DIMMER SWITCH Integral with Turn Signal Lever  
: HEADLIGHTS (2) Sealed Beam Halogen, 5" X 7" Rectangular, with Chrome Plated Bezels  
: HORN, ELECTRIC Single  
: JUMP START STUD Located on Positive Terminal of Outermost Battery  
: PARKING LIGHT Integral with Front Turn Signal and Rear Tail Light  
: RUNNING LIGHT (2) Daytime, Included With Headlights  
: STARTER SWITCH Electric, Key Operated  
: STOP, TURN, TAIL & B/U LIGHTS Dual, Rear, Combination with Reflector  
: TURN SIGNAL SWITCH Self-Canceling with Lane Change Feature  
: TURN SIGNALS, FRONT Includes Reflectors and Auxiliary Side Turn Signals, Solid State Flashers; Flush Mounted  
: 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  
CIGAR LIGHTER

8518

8630 IGNITION SWITCH Keyless

8GDY ALTERNATOR {Leece-Neville 4949PA} Brush Type; 12 Volt 270 Amp. Capacity, Pad Mounted

8HAB BODY BUILDER WIRING Back of Standard Cab at Left Frame or Under Extended or Crew Cab at Left Frame; Includes Sealed Connectors for Tail/Amber Turn/Marker/Backup/Accessory Power/Ground and Sealed Connector for Stop/Turn

8MKL BATTERY SYSTEM {International} Maintenance-Free, (3) 12-Volt 1950CCA Total  
8RGS RADIO {International} AM/FM Stereo With Weatherband, Clock, Includes Multiple Dual Cone Speakers  
Includes: SPEAKERS IN CAB (2) Dual-Cone with Deluxe Interior

8WCL HORN, AIR Black, Single Trumpet, Air Solenoid Operated, Mounted Behind Bumper on Right Rail

8WTK STARTING MOTOR {Delco Remy 38MT Type 300} 12 Volt; less Thermal Over-Crank Protection

8WWJ INDICATOR, LOW COOLANT LEVEL With Audible Alarm 1/0 1  
8XAH CIRCUIT BREAKERS Manual-Reset (Main Panel) SAE Type III With Trip Indicators, Replaces All Fuses Except For 5-Amp Fuses

9585 FENDER EXTENSIONS Rubber  
9HAD GRILLE Chrome

9WAY FRONT END Tilting, Fiberglass, With Three Piece Construction

10060 PAINT SCHEMATIC, PT-1 Single Color, Design 100  
Includes  
: PAINT SCHEMATIC ID LETTERS "GM"

10761 PAINT TYPE Base Coat/Clear Coat, 1-2 Tone  
10769 PAINT CLASS Premium Color11001 CLUTCH Omit Item (Clutch & Control)

12NTC ENGINE, DIESEL {International MaxxForce 9} 50 State, 300 HP, 800 lb-ft Torque

@ 1200 RPM, 2200 RPM Governed Speed, # 2 Bell Housing

Includes: COLD STARTING EQUIPMENT Intake Manifold Electric Grid Heater with Engine ECM Control  
: CRUISE CONTROL Electronic; Controls Integral to Steering Wheel  
: ENGINE OIL DRAIN PLUG Magnetic  
: ENGINE SHUTDOWN Electric, Key Operated  
: FAN Optimized Position  
: FUEL/WATER SEPARATOR and FUEL FILTER in a Single Assembly; With Water-in-Fuel Sensor; Mounted on Engine  
: GOVERNOR Road Speed, Electronic  
: OIL FILTER, ENGINE Spin-On Type  
12THT FAN DRIVE {Horton Drivemaster} "Two Speed" Direct Drive, With Residual Torque Device for Disengaged Fan Speed  
Includes: FAN Nylon  
12UWZ RADIATOR Cross Flow, Series System; 1228 SqIn Aluminum Radiator Core With Internal Water to Oil Transmission Cooler and 1167 In Charge Air Cooler  
Includes: DEAERATION SYSTEM with Surge Tank  
12UXV FEDERAL EMISSIONS for 2004; for International VT365, DT466 and DT570 Engines  
12VBC AIR CLEANER Single Element  
Includes  
: GAUGE, AIR CLEANER RESTRICTION Air Cleaner Mounted  
12VXT THROTTLE, HAND CONTROL Engine Speed Control; Electronic, Stationary, Variable Speed; Mounted on Steering Wheel  
12VYW FEDERAL EMISSIONS 2007 for International MaxxFace 9 & 10 Engines (DT570 & HT570)  
12VZA ENGINE CONTROL, REMOTE MOUNTED Provision for; Includes Wiring for Body Builder Installation of PTO Controls; With Ignition Switch Control for International post 2007 Emissions Electronic Engines  
12WYS EXPANDED ENGINE TEMP EFFECTS to Allow Higher Engine Operating Temperature Range; Includes Nylon Surge Tank and 15 psi Pressure Cap  
13AJV TRANSMISSION, AUTOMATIC {ALLISON 3000EVS\_P} 4th Generation Controls; Close Ratio, 5-Speed; With Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, Max. GVW N/A  
Includes: OIL FILTER, TRANSMISSION Mounted on Transmission  
: TRANSMISSION OIL PAN Magnet in Oil Pan  
TRANSMISSION SHIFT CONTROL {ALLISON} T handle lever; for Allison 3000 & 4000 Series Transmission  
13WDX SHIFT CONTROL PARAMETERS WT-Allison S-4 Economy Programming in Primary and Allison S-1 Performance Programming in Secondary  
13WLD TRANSMISSION OIL {Castrol TranSynd} Synthetic; 29 thru 42 Pints 0/0 0  
13WUD ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS); Rescue, Ambulance  
14AET AXLE, REAR, SINGLE {Dana Spicer 21060S} Single Reduction, 21,000-lb Capacity, Hypoid Gearing With 200 Wheel Ends  
14VAH Includes: REAR AXLE DRAIN PLUG (1) Magnetic, For Single Rear Axle SUSPENSION, RR, SPRING, SINGLE Vari-Rate; 23,500-lb Capacity, With 4500 lb Auxiliary Rubber Spring  
14WLA AXLE, REAR, LUBE {EmGard 75W-90} Synthetic Oil; 1 thru 29.99 Pints

14WAP SHOCK ABSORBERS, REAR (2) 0/47 47  
15SCD FUEL TANK Top Draw; D Style, Steel, 50 U.S. Gal., 189 L Capacity, 16" Deep, With Quick Connect Outlet, Mounted Right Side, Under Cab

16030 CAB Conventional Includes  
: ARM REST (2) Molded Plastic; One Each Door  
: CLEARANCE/MARKER LIGHTS (5) Flush Mounted  
: COAT HOOK Located on Rear Wall, Centered Above Rear Window  
: FLOOR COVERING Rubber, Black  
: GLASS, ALL WINDOWS Tinted  
: GRAB HANDLE, CAB INTERIOR (1) "A" Pillar Mounted, Passenger Side  
: GRAB HANDLE, CAB INTERIOR (2) "B" Pillar Mounted, One Each Side  
: STEP (4) Two Steps Per Door  
HEATER HOSES Silicone

16975  
16HBA GAUGE CLUSTER English With English Electronic Speedometer 0/0 0  
Includes  
: GAUGE CLUSTER (5) Engine Oil Pressure (Electronic), Water Temperature (Electronic), Fuel (Electronic), Tachometer (Electronic), Voltmeter  
: ODOMETER DISPLAY, Miles, Trip Miles, Engine Hours, Trip Hours, Fault Code Readout  
: WARNING SYSTEM Low Fuel, Low Oil Pressure, High Engine Coolant Temp, and Low Battery Voltage (Visual and Audible)

16HGH GAUGE, OIL TEMP, ALLISON TRAN  
16HHE GAUGE, AIR CLEANER RESTRICTION {Filter-Minder} With Black Bezel Mounted in Instrument Panel  
16HKT IP CLUSTER DISPLAY On Board Diagnostics Display of Fault Codes in Gauge Cluster

16JNT SEAT, DRIVER {National 2000} Air Suspension, High Back With Integral Headrest, Vinyl, Isolated, With 2 Position Front Cushion Adjustment, -3 to +14 Degree Seat Back Adjustment, Single Chamber Air Lumbar Support  
Includes  
: SEAT BELT 3-Point, Lap and Shoulder Belt Type  
16PHJ SEAT, TWO-MAN PASSENGER {Gra-Mag} With Two Integral Headrest, Vinyl, With Fixed Back, Less Under Seat Storage Compartment  
Includes  
: SEAT BELT (2) One 3-Point Shoulder Belt and One 2-Point Lap Belt (Center Position)

16SDC GRAB HANDLE (2) Chrome Towel Bar Type With Anti-Slip Rubber Inserts; for Cab Entry Mounted Left and Right  
MIRRORS (2) {Lang Mekra} Styled; Rectangular, 7.09" x 15.75", Brackets Breakaway Type, With 102" Wide Spacing, With Integral Convex Both Sides, With Bright Finish Heads and Brackets - Heated

16VBW CAB MOUNTING HEIGHT EFFECTS Mid Cab in Lieu of Low Cab Mounting Height (Approx. 4") for Increased Cooling System Requirements

16VBZ SEAT BELT All Red; 1 to 3  
16WJS INSTRUMENT PANEL Center Section, Flat Panel  
16WKB AIR CONDITIONER {International Blend-Air} With Integral Heater & Defroster  
Includes  
: HEATER HOSES Premium  
: REFRIGERANT Hydrofluorocarbon HFC-134A

16WRX CAB INTERIOR TRIM Deluxe  
Includes  
: "A" PILLAR COVER Molded Plastic  
: CAB INTERIOR TRIM PANELS Molded Plastic, Full Height; All Exposed Interior

16WSE	Sheet Metal is Covered Except for the Following: with a Two-Man Passenger Seat the Back Panel is Only Partially Covered and with a Full Bench Seat the Back Panel is
16WSK	LOW WASHER FLUID INDICATOR 1/0 1
27DMA	CAB REAR SUSPENSION Air Bag Type 26/9 35
	WHEELS, FRONT DISC; 22.5" Painted Steel, 2 Hand Hole, 10 Stud (285.75MM BC) Hub Piloted, Flanged Nut, Metric Mount, 8.25 DC Rims; With Steel Hubs.
	Includes
	: PAINT IDENTITY, FRONT WHEELS White
28DMA	: WHEEL SEALS, FRONT Grease Lubricated, Includes Wheel Bearings
	WHEELS, REAR DUAL DISC; 22.5" Painted Steel, 2 Hand Hole, 10-Stud (285.75MM BC) Hub Piloted, Flanged Nut, Metric Mount, 8.25 DC Rims; With Steel Hubs
	Includes
	: PAINT IDENTITY, REAR WHEELS White
29563	: WHEEL SEALS, REAR Oil Lubricated, Includes Wheel Bearings
	WHEEL SEALS, FRONT {Dana Spicer Outrunner} for Oil Lubricated Wheel Bearings
29WLA	WHEEL BEARING, FRONT, LUBE {EmGard 50W} Synthetic Oil
7382130116	(4) TIRE, REAR 11R22.5 G164 RTD M+S (GOODYEAR) 499 rev/mile, load range H, 16 ply
7382130155 (2)	TIRE, FRONT 11R22.5 G149 RSA (GOODYEAR) 501 rev/mile, load range H, 16 ply

## **BUMPER EXTENSION**

The front bumper and frame shall be extended for miscellaneous uses. The frame modification or factory extension shall be capable of adequately supporting the weight of a 250 pound person, and/or equipment or hose storage.

A 3/16" bright aluminum tread plate apron shall be installed between the bumper and front face of the cab. Stainless steel screws shall be used to attach the apron to the bumper flange.

## **FRONT BUMPER HOSE TRAY**

There shall be two hose storage areas integrated into the front bumper extension. Storage wells shall accommodate 150 of 1" hose. The hose wells shall be constructed of .125" aluminum. The hose well shall be approximately 26 wide x 10" deep x 15" front to back. The well shall be mounted between the extension rails. A treadplate style shoebox lid shall be provided with trigger latches.

## **CHASSIS STEPS**

The original steps into the truck shall be removed; new continuous running aluminum tread-brite steps shall be installed on both sides.

The fuel tank shall be enclosed with aluminum tread-brite. The enclosure shall incorporate the OEM tank step recess and fuel filler. All seams shall be continuously welded.

The step shall be so arranged that a fireperson wearing heavy boots and turnout gear can easily gain access to all cab doors.

The steps shall provide anti-slip protection and shall be constructed of a raised punch aluminum diamond tread plate to facilitate draining of accidentally spilled fuel.

The truck batteries are to be located behind the steps on the left side, easily removable for servicing.

## **REAR TOW EYES**

There shall be two (2) chrome tow eyes mounted directly to the truck frame rails through the rear of the body below the rear compartment capable to with stand the requirements of towing (not lifting) the apparatus without damage.

## **CAB CONSOLE**

Between the two front seats, a console shall be constructed of .125" aluminum tread plate. It shall provide mounting locations for the siren head, control switches, as well as open storage for binders, maps, etc....

## **STAINLESS STEEL TRIM**

A Phoenix wheel trim package consisting of stainless steel lug nut covers and axle hubs caps for a set of four (4) wheels shall be installed for the front and rear aluminum wheels.

## **FLUID IDENTIFICATION PLATE**

A permanently engraved plate shall be installed in the cab specifying the quantity and type of fluids used in the apparatus.

## **FUEL TYPE PLATE**

A permanently engraved plate shall be installed on or near the fuel fill to designate the chassis fuel type.

## **SEATING LABEL**

There shall be a label located in the cab or in view of the driver, stating maximum seating capacity.

## **VEHICLE HEIGHT LABEL**

There shall be a label located in the cab or in view of the driver, stating the overall height of the vehicle.

## **SEAT BELT WARNING LABEL**

There shall be a label located at all seating areas, warning personnel that death or serious injury could result from not wearing seat belts while the vehicle is in motion.

## **RIDING ON STEP WARNING LABEL**

There shall be a label located at all exterior stepping surfaces, stating "Warning: Death or serious injury may result from riding on any stepping surface when the vehicle is in motion.

## **REAR MUD FLAPS**

There shall be a set of rear anti-spray black mud flaps shall be installed in the rear wheel well.

## **BODY CONSTRUCTION**

The apparatus body shall be constructed of minimum 1/8" 5052 alloy aluminum sheet and extrusions. Body and subframe shall be aluminum, NO EXCEPTIONS.

The subframe shall consist of aluminum alloy extrusions electrically welded both sides at each joint with 5356 aluminum alloy welding wire. All aluminum extrusions shall be 6061T6 or 6063T6 alloy.

The complete apparatus body shall be all welded construction, free from nuts, bolts and other fasteners. The complete apparatus body and subframe shall be free from all burrs and sharp edges.

The main body support crossmembers shall consist of aluminum "I" beam with a web thickness of .326. The front compartment crossmember shall consist of a 4" aluminum "C" with a web thickness of .190. These crossmembers shall extend the width of the body to support the compartment framing.

Tank support crossmembers shall consist of aluminum "I" beam with a web thickness of .190. These crossmembers shall extend the width of the tank and be installed on 15" centers. Cross-members shall be welded to a 1/2" X 3" solid aluminum, 6061T6 aluminum alloy frame rail extrusion.

The frame rail extrusion shall be isolated from the steel chassis frame rails with a 1/8" X 3" poly strip. Tank crossmembers shall butt into full-length longitudinal tank support rails consisting of 4" aluminum "C" with a web thickness of .180.

The apparatus body/subframe structure shall be securely fastened to the chassis frame rails with a minimum of six (6) 5/8" O.D. steel "U" bolts. In addition, a minimum of two (2) adequately gusseted and reinforced shear plated with a minimum of two (2) 1/2" grade 8 shear bolts in each plate shall be installed on the forward portion of the body subframe.

Compartment floors shall be of sweepout design formed from smooth aluminum plate. Compartments shall be adequately vented and drained with baffles installed to prevent water from entering from outside.

There shall be a .250" hole installed in the lower corners of the inside door pans for drainage. The doors shall have a closed cell neoprene rubber gasket installed around the perimeter of the door to carry off water.

The rear tailboard shall be constructed from 3/16 aluminum and securely mounted to body super structure. It shall be a minimum of 10 deep. As specified in NFPA 1901-2003 edition, the tail board shall be designed to sustain a minimum static load of 500lbs with out deformation and shall be punch raised to provide skid resistance when stepping. It shall adequately support the stepping and standing of a fire person in full turn out gear but not be used to transport firefighters.

There shall be full radius wheel liners installed. They shall extend from the springs to the outside of the body.

### **RESCUE STYLE PUMPER BODY (ROLL DOORS)**

The doors shall be of the type that roll up on themselves. The door shall have an adjustable tubular type counter balance.

All door tracks shall have track, post, and track protector extruded in an integral heavy duty section for added strength 6061-T6 alloy. The door track shall be an integral part of the body frame work. The door shall be sealed on all sides with black weather stripping. Doors shall be capable of being removed for servicing.

All doors shall be of heavy duty extruded aluminum sectionals; 6063-T6 alloy for finishing purposes. The door slide system shall consist of a nylon slide with end shoes. They shall slide inside of the aluminum door track.

The doors shall use an independent cam type positive locking lift bar latch. Alternative door latching may be considered, bidder shall specify with bid and provide details. Door latching to be approved by Fire Department. All doors shall be equipped with indicator switches to alert the driver that one or

more doors are not fully closed. These switches may all be connected to a single warning light on the dash of the cab.

The compartments shall be configured as described:

The left side compartment behind the pump panel shall measure approximately 23 inches wide by 62 inches tall by 25 inches deep in the lower & in the upper section.

The over the wheel left side compartment shall measure 52 inches wide by 28 inches tall by 25 inches deep.

The rear left side compartment shall measure approximately 30 inches wide by 62 inches tall. It shall be a transverse compartment through to the right side.

The right side compartment behind the pump panel shall measure approximately 23 inches wide by 62 inches tall by 25 inches deep in the lower & in the upper section.

The over the wheel right side compartment shall measure 52 inches wide by 28 inches tall by 25 inches deep.

The rear right side compartment shall measure approximately 30 inches wide by 62 inches tall. It shall be transverse compartment through to the right side.

The rear step compartment shall measure approximately 48 inches wide, by 60 inches tall and approximately 30 inches deep.

## **ROOF TOP STORAGE CONFIGURATION**

The compartments shall be arranged as follows:

There shall be a series of storage compartments on each side of the roof mounted against the extended head rail.

The driver side box shall extend from the front of the body down the side and terminate 17" from the back of the truck, to provide a platform for ascending and descending from the ladder. The passenger side box shall be a mirror image of the drivers leaving a minimum of 20" open space at the rear of the body. Both compartments shall be approximately 100" long by 24" wide by 14" deep. Because the length of the box the lid shall be divided into sections with two separate flip up lids per compartment.

## **ROOF LADDER**

A Zico Quic-Ladder shall be installed on the left rear of the body. This ladder shall provide access to the roof of the unit. Ladder shall be constructed of 1-1/4" aluminum tubing, covered between each rung with a ribbed neoprene black tubing for a firm grip. The rungs shall be cast aluminum with non-skid surface. Each rung shall have a 3" Deep x 15" Wide surface area.

Ladder features a positional climbing angle. The ladder stores parallel to the body vertical surface when not in use, but pulls out away from the body and locks into a comfortable angle position for ascending and descending from the rooftop. A quick release handle shall allow the release of the scissor mechanism, which will extend the ladder outward from the body until it locks into its final climbing position.

## **GRAB RAILS**

Hand rails of 1 1/4" diameter aluminum extrusion anti-slip grip, shall be mounted as follows: one (1) near the control panel to assist the operator onto running boards. Hand rail shall meet or exceed the National Fire Protection Associations Pamphlet 1901.

## **FOLDING STEPS**

There shall be NFPA compliant folding step supplied and installed on the unit for access to the upper body area of the apparatus.

There shall be two (2) located on the left and right side on the front of the body near the operator's panel.

## **ADJUSTABLE SHELF**

The heights of all shelves shall be easily adjustable by using P-1000 aluminum unistrut, welded permanently to the side bay walls, along with appropriate fasteners. The unistrut is to be continuous from the top to the bottom portion of the compartment.

All shelves shall be capable of supporting a minimum weight of three hundred (300) pounds.

All shelves are to be of 3/16" smooth aluminum with press formed flanges of 2" on all four sides and have D.A. sanded finish.

Shelf dimensions shall vary to accommodate the specified compartment for which it is to be mounted.

There shall be five (5) adjustable shelves mounted on unistrut as per fire department instruction.

There shall be (1) one adjustable shelf located in the left side (L1) compartment ahead of the rear wheel.

There shall be (1) one adjustable shelf located in the right side (R1) compartment ahead of the wheel.

There shall be (1) one adjustable shelf located in the left side (L3) compartment behind the rear wheel.

There shall be (1) one adjustable shelf located in the right side (R3) compartment behind the rear wheel.

There shall be (1) one adjustable shelf located in the rear compartment behind the rear wheel.

## **HEAVY DUTY SLIDE TRAY (SLIDE MASTER)**

There shall be one (1) heavy-duty slide trays installed in a specified compartment, as directed by the fire department.

All trays are to be of 3/16" smooth aluminum with press formed flanges of 2" on all four sides. Tray dimensions shall vary to accommodate the specified compartment for which it is to be mounted.

Tray slides shall use heavy steel rail construction, and stainless steel ball bearings. Each tray shall extend outward of the compartment 70 percent of the tray length and shall be able to support up to a 500 lbs. of distributed weight.

There shall be One heavy-duty slide tray shall be located at pre-construction.

## **SCBA STORAGE IN WHEEL WELL**

There shall be four (4) SCBA cylinder storage compartments recessed one in each corner of wheel well. The compartment door shall be a latchable, brushed aluminum type. All SCBA storage compartment will be double bottle storage compartments.

## **COMPARTMENT FLOOR TILE**

Each compartment floor, all shelving and slide trays in the apparatus body shall have Mateflex installed.

## **PUMP**

Pump shall be Hale and of a size and design to mount on the chassis rails of commercial and custom truck chassis, and have the capacity of 500 gallons per minute (U.S. GPM), NFPA-1901 rated performance.

The entire pump shall be assembled and tested at the pump manufacturer's factory.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 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. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

Pump body shall be split, on a single plane for easy removal of entire impeller assembly including wear rings and bearings from beneath the apparatus without disturbing piping or the mounting of the pump in chassis.

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

Mechanical seal only required on the inboard side of the pump. The mechanical seal must be two (2) inches in diameter and shall be spring loaded, maintenance free and self-adjusting. Mechanical seal construction shall be a carbon-sealing ring, stainless steel coil spring, and a tungsten carbide seat.

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.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel; Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

## **GEARBOX**

The gearbox shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive and tail shafts shall be of heat-treated chrome nickel steel and be equipped with an airshift system to select between road and pump when pump is split driveline mounted.

All gears shall be precision ground and of the 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, and higher load carrying capability.

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

For automatic transmissions, three green warning lights shall be provided to indicate to the operator when the pump has completed the shift from Road to Pump position. Two green lights to be located in the truck driving compartment and one green light on the pump operators panel adjacent to the throttle control.

## **CERTIFICATION**

The pump will meet and perform the following test and certification stating, same issued

100% of rated capacity @ 150# net pump pressure

100% of rated capacity @ 165# net pump pressure

70% of rated capacity @ 200# net pump pressure

50% of rated capacity @ 250# net pump pressure

## **PRIMING PUMP**

The priming pump shall be a positive displacement vane type, electrically driven, and conform to standards outlined in NFPA Pamphlet No. 1901. One priming control shall both start the priming motor, and open the priming valve.

## **MOUNTING**

Extra heavy-duty pump mounting brackets shall be furnished. There 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 will be the same on each end of the drive shaft. This will assure full capacity performance with a minimum of vibration. Mounting hardware shall utilize grade 8 bolts.

## **AUXILIARY 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 of water circulating through the engine cooling system. This cooling shall be done without mixing engine and pump water.

## **PLUMBING**

Pump plumbing shall utilize a stainless steel manifold system. Discharges and auxiliary inlets shall be plumbed using these manifold systems. Any plumbing connections shall have flexibility to prevent undue stress to the plumbing systems. Victaulic or rubber couplings shall be used where necessary to allow flexing of plumbing, which will prevent damage or loosening of piping. High-pressure hose, rated for the fire industry along with stainless steel connections shall be utilized where necessary.

Pump and plumbing shall meet the standards of the latest NFPA requirements.

## **VALVES**

All intake and discharge shall be Hale brand Torrent stainless steel valves shall be quarter turn, full flow valves. Each valve shall be operated by a control located on the pump panel. Any valve 3 or larger shall be provided with a slow close feature.

## **STEAMER INLETS**

A 4" steamer inlet shall be provided on the left side pump panel. It shall have NST threads and terminate with a screen and long handled chrome cap.

## **MASTER DRAIN**

Master drain that will have the capacity to drain all lines and main pump at the same time. The master drain will be mounted under the running board on the left side of the vehicle for ease of operation.

## **PANEL CONSTRUCTION:**

The Gauge panel shall be constructed of brushed stainless steel.

The upper portion of operators panel will be formed to extend upward and have stainless steel hood returning forward, thus forming a illumination hood for panel lights. Under this hood there will be two (2) halogen lights with switch located at the top pump panel.

All controls, discharge and suction gauges are to be identified at the gauge and discharge and suction points as well as open-closed positions with identification plates of color background and natural letters.

Pump discharge and suction inlets will extend through the stainless panels at each side of the apparatus. The 3/4 drain valves for each of the 2-1/2 or larger side discharges will be supplied.

## **INSTRUMENT PANEL**

The instrument panel must contain the following gauges and equipment. These are to be located according to N.F.P.A. 1901 applicable codes.

A Class One Captain Pressure Governor will be supplied on the pump panel. The unit shall regulate the engine speed to maintain a steady pump pressure regardless of the flow rate. Operation shall be changeable from pressure mode to RPM mode and back again if desired while pumping without any pressure variation using the MODE button. Pressure or RPM setting shall be varied using the INCREASE and the DECREASE buttons. A PRESET button allows a preprogrammed pressure or RPM to be set quickly. This preprogrammed Pressure or RPM setting shall be stored in the memory even with the power off. An IDLE button allows for quick shutdown after each operation. EFC shall bring the engine to idle in the event of pump cavitation. It shall resume **operation automatically** once water is available to the pump again.

The Captain shall display the pump Discharge and intake pressure. It shall display pressure in psi up to 600 psi. The Intake pressure display window shall also display the control setting each time a setting is changed; The engine RPM shall be displayed in 10 RPM increments. The visual alarm is not cancelable while the audio alarm shall be cancelable using the SILENCE button. All warnings shall reset automatically when the problems are corrected.

There shall be a 4-1/2" Class one gauge supplied for the master intake and discharge.

A Class One 2-1/2 compound pressure gauge shall be supplied for each discharge 1-1/2 or larger unless otherwise specified. The specified pressure gauge will be located directly be of the liquid silicone filled type. Water pressures and suction gauges will be filled with liquid silicone solution to assure visual reading to with 1% accuracy and function accurately in sub-zero temperatures.

This liquid silicone gauges eliminates the need of snubber valves.

The engine oil pressure, engine water temperature, tachometer, audible and visual warning devices shall be performed by an all in one instrument panel.

A Class One "All In One" instrument panel shall be installed on the pump panel with in easy access of the operator. The All in one module shall eliminate the use of multiple gauges, alarms and warnings to simplify the pump operator's panel. The unit provides a large display for the engine RPM, battery voltage, and display engine oil pressure and coolant temperature. Plus provides visual and external audible warning such as, horn or a bell to identify any monitored failure. Unit also, accumulates and displays engine hours, pump operating hours and incident times.

The throttle and pump in gear indicator will also be installed in the center of the pump operators panel.

The following instruments and controls will be supplied at the operators panel:

One (1) -30 x 600 PSI chrome 4 -1/2 main pressure gauge.

One (1) -30 x 600 PSI chrome 4 -1/2 main suction gauge

One (1) 0 x 600 PSI chrome 2-1/2 individual pressure gauges for each 1-1/2 or larger discharge.

One (1) Class One Enfo IV instrument panel

One (1) Class One Captain Pressure Governor

One (1) Intelli Tank lighted level water gauge.

One (1) engine cooler control.

One (1) tank fill control.

One (1) pump to tank control.

Pump cooling controls.

Pump discharge controls.

Relief valve control.

Primer control

U.L. test plug panel.

## **LABELS**

Each control and gauge will be clearly marked by a color-coded name plate, permanently affixed to the operators panel.

All discharge and suction gauges are to be identified at the gauge and discharge and suction points as well as open-closed positions with identification plates of black background and natural letters.

## **PUMP MODULE**

Due to trying to keep the overall size of the vehicle to a minimum, the size of the pump, and pump house panels must be of important consideration. The entire pump and pump module must be located in front of the body compartments and cannot exceed 26" in overall width.

The pump module shall be a self-supported structure mounted independently from the body and chassis cab. The design shall allow normal frame deflection without imposing stress on the pump module structure of side running boards. The pump module shall be a welded aluminum assembly properly constructed and braced to withstand the rigors of chassis frame flex. The pump module shall be bolted to the frame rails at four points.

Aluminum tread plate running boards shall be installed along both sides of the pump house to provide access to the operator's panel. Running boards shall be separate from the pump house and not be an integral part of a compartment. They shall maintain at least a 1/2 clearance from pump hose. Each step shall be rigidly braced and supported.

## **PUMP PANELS**

The pump house side panels shall be constructed from stainless steel panels and shall be removable in order to access the internal pump house.

Above both side pump panels, there shall be stainless steel hinged access panels to access the pump house. The left side panel or instrument panel shall be horizontally hinged for pump maintenance and gauge inspection. The right side hinged access panel shall be a inspection door. Each panel shall be hinged using a continuous stainless steel hinge and be operated by a two (2) Eberhard style trigger latches.

Controls for pump system will be accessible at the side mounted operators panel.

The upper portion of the both the side operators panel and right side will be formed to extend upward and have stainless steel hood returning forward, thus forming a illumination hood for panel lights. Under this hood there will be two (2) halogen lights with switch located on the pump panel.

The side mount valve controls will be T handle type. The valve control levers will extend through the side panels and be supplied with a twist lock device. The valve control levers will utilize direct linkage and will be uniformly grouped with each respective gauge.

All controls, discharge and suction gauges are to be identified at the gauge and discharge and suction points as well as open-closed positions with identification plates of color background and natural letters.

Pump discharge and suction inlets will extend through stainless steel panels at each side of the apparatus. The 3/4 drain valves for each of the 2-1/2 or larger side discharges will be supplied.

## **TANK TO PUMP**

The tank to pump valve shall be a 3" inline Hale Torrent stainless steel valve, installed between the water tank and the pump. Controls for the valve shall be provided on the operators control panel.

## **TANK FILL**

One (1) 1.5" inline Hale Torrent stainless steel valve shall be supplied off the discharge side of pump and be plumbed into the front head of the tank using high-pressure hose. Controls shall be provided on the operators panel.

## **LEFT SIDE DISCHARGES**

There shall be one (1) quarter turn, Hale Torrent stainless steel discharge valve(s) shall be provided behind the left side pump panel. Control for discharge valve shall be provided on operators pump panel. The discharge(s) shall terminate with a 30 degree elbow with male NST threads, and have a high polished chrome cap with chain. Each discharge is to be equipped with a .750" push/pull drain valve. Drains shall discharge below the running board. The discharge is to have a 2.5" Class 1, SubZII compound gauge.

## **RIGHT SIDE DISCHARGES**

There shall be one (1) quarter turn, Hale Torrent stainless steel discharge valve(s) shall be provided behind the right side pump panel. Control for discharge valve shall be provided on operators pump panel. The discharge(s) shall terminate with a 30 degree elbow with male NST threads, and have a high polished chrome cap with chain. Each discharge is to be equipped with a .750" push/pull drain valve. Drains shall discharge below the running board. The discharge is to have a 2.5" Class 1, SubZII compound gauge.

## **CROSSLAYS**

There shall be one (1) divided double crosslay hosebed capable of holding 250 feet of 1.75" hose in each section installed above the pump house. The hose bed is to be constructed of extruded aluminum flooring for maintenance free service. The hosebed divider shall be installed on an aluminum track to allow the department adjustability.

The crosslay shall be equipped with 2" swivels, 2" plumbing, 2" Hale Torrent stainless steel valves and high pressure reinforced hose. Controls for the crosslay shall be provided at the operator's panel. A 2.5" Class 1, Sub ZII gauge shall be supplied for each crosslay.

## **SUCTION (S)**

One (1) 2.5" auxiliary suction Hale Torrent stainless steel valve with chrome female swivels and NST threads shall be provided and be mounted on left side pump panel.

One (1) 2.5" auxiliary suction Hale Torrent stainless steel valve with chrome female swivels and NST threads shall be provided and be mounted on right side pump panel. Valve to be controlled from the pump operators panel.

## **POLY TANK**

The tank shall have a capacity of 300 U.S. gallons complete with a Lifetime Warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the markings and notice is to inform department personnel who store, stock, or use the tank that the unit is under warranty. Markings may be brief but should include a short statement that a warranty exists, the substance of the warranty, its duration, and who to notify if the tank is found to be defective.

## **CONSTRUCTION**

The shall be constructed of 1/2" thick polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermoplastic, natural in color, and UV stabilized for maximum protection.

The booster tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. All joints and seems shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank is fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removability. The transverse swash partitions shall be manufactured of 3/8" polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" polypropylene (natural in color) and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are welded to each other as well as to the walls of the tank.

## **FILL TOWER AND COVER**

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The tower shall be located in the left front corner of the tank unless otherwise specified by the purchaser in Special Provisions. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged-type cover. Inside the fill tower, approximately 4" down from the top, shall be fastened a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene

pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped behind the rear wheels where specified by the purchaser in Special Provisions so as to maximize traction.

The tank cover shall be constructed of 1/2" thick polypropylene, natural in color, and UV stabilized, to incorporate a three-piece locking design, which allows for individual removal and inspection if necessary. The tank cover shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2-13 to accommodate the lifting eyes.

## **SUMP**

There shall be one (1) sump standard per tank. The sump shall be constructed of 1/2" polypropylene and be located in the left front quarter of the tank, unless specified otherwise in Special Provisions. On all tanks that require a front suction, a 3" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug. This shall be used as a combination clean-out and drain. All tanks shall have an antiscum plate located approximately 2" above the sump.

## **OUTLETS**

There will be two (2) standard tank outlets: one for tank-to-pump suction line, which shall be a minimum of 3" N.P.T. coupling; and, one for tank fill line, which shall be a minimum of 3" pipe, N.P.T. coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 G.P.M. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through the tank sleeves to accommodate rear discharge piping must be specified in Special Provisions. All auxiliary outlets and inlets must meet all NFPA 1900 guidelines in effect at the time of manufacture.

## **MOUNTING**

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

The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4" Additionally, the tank must be supported around the entire bottom outside perimeter and captured both front and rear as well as side to side to prevent tank from shifting during vehicle operation.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate hold down restraints to minimize movement during vehicle operation. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

## **12 VOLT GENERAL REQUIREMENTS**

All electrical work shall be performed by persons familiar with emergency vehicle systems.

All of the emergency electrical equipment shall be served by circuits separate and distinct from the vehicle chassis circuits.

The 12-Volt DC electrical system shall be controlled by an industry proven electrical system.

## **WIRING REQUIREMENTS:**

The complete 12-volt wiring system and electrical appliances shall meet NFPA 1901 minimum standards as well as standard automotive practices throughout the its installation in the apparatus. The system shall comply with all the appropriate SAE recommended practices such as J1939 and/or J1708.

All required DC power conducting wiring shall be of GXL stranded copper wire of adequate gauge for the function served so as to ensure voltage drop of less than one volt at the appliance under full amperage load.

Body wiring shall be color and function coded, grease, oil and moisture resistant, routed in protective loom through protected locations, neatly and securely fastened, and all apertures properly grommited for passing wiring. Solderless insulated connectors shall be provided where required. Primary wiring harnesses shall be bench assembled. Where crimp connections are necessary, the connections shall be made using approved connectors with heat shrink insulators. Any wiring routed within proximity of any exhaust components or other high temperature components shall be given special consideration and shielded for best protection.

Any required signal conductors shall be shielded twisted pairs rated by the system manufacturer to carry the multiplex command signals from the switch panel to the control modules.

## **ELECTRICAL MANAGEMENT SYSTEM:**

The system installed shall be easily re-programmable and reconfigurable. Most factory authorized service centers or technicians will have on hand all required diagnostic hardware and software required for maintenance of the installed system.

## **PC DIAGNOSTICS**

The system shall incorporate a feature that enables a service representative to troubleshoot, repair and replace nodes in the system, should they for any reason fail. It will be run via a PC interface and will monitor all system information. All messages going across the communications bus must be seen on the screen, including analog information. Each node must be capable of being queried for its own voltage drop and capable of obtaining the status of all inputs and outputs from the diagnostics interface.

The system shall feature the following:

- Total load management
- Load shedding capabilities (will begin load shedding when voltage drops below selected level after a 2 minute period per output.)
- Load sequencing capabilities
- PC Diagnostics
- Error reporting
- Continuous system monitoring and reporting

## **PC PROGRAMMING**

The system must be programmable at the factory in a language that can be downloaded to a remote service representative's PC or down loader tool with all OEM data, as programmed for this specific unit and allow field reprogramming changes as provided by the unit manufacturer.

## **EMI/RFI PROTECTION**

The electrical system proposed shall include means to control undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components will be used to insure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The unit proposed will have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor will be able to demonstrate the EMI and RFI testing has been done and meets SAE J551 requirements. Harness and cable routing be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

## **CONTROLS & FUNCTIONS**

A switch panel controlling electrical devices and equipment installed on the chassis and body shall be located in the cab within easy access to the driver or centrally located convenient to the driver and/or officer positions. The panel shall include switches arranged in the most convenient and practical manner that is possible.

The panel shall control individually all emergency warning light circuits, which shall also be controlled by warning master switch.

## **SERVICE AND MAINTENANCE DIAGNOSTIC**

Advanced unit service and maintenance will be assisted with an integral software program. The software will provide troubleshooting tools to service technicians to understand diagnostic procedures; failure detection; warning regarding components; System simulation and pinging of nodes for status verification.

All electrical and emergency lighting equipment and circuits not controlled by the electronic management system shall be supplied with automatic reset circuit breakers of appropriate amperage. These circuits shall be operated through a Bosch or equal continuous duty relay to remove load from all switches.

## **BATTERY DISCONNECT SWITCH**

A Cole Hersey brand M-284-01 master battery disconnect switch shall be installed in a convenient location to the driver.

## **BATTERY LIGHT**

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

## **STOP / TAIL / TURN / BACKUP LIGHTS**

Body shall be equipped with stop, tail, turn and back up lights as required by Federal Motor Vehicle Safety Standards.

New stop/tail, turn and back-up lights, shall be installed according to the FMVSS requirements. The stop, tail, turn light type used shall be Whelen brand 600 series L.E.D lights installed in cast aluminum housings mounted to the rear of the apparatus. The back up light shall remain halogen white.

## **CLEARANCE / MARKER LIGHTS (L.E.D)**

The apparatus body shall be equipped Truck-Lite brand L.E.D marker lights. Lights shall be of the proper color and in accordance with the Federal Motor Vehicle Safety Standards (FMVSS).

## **BACKUP ALARM**

An Ecco brand backup alarm shall be installed and shall be activated when the unit is placed in reverse gear.

## **COMPARTMENT LIGHTS**

The body compartments shall be equipped with low voltage LED strip lights. Each light shall provide a series of LEDs be enclosed in a durable and impact resistant lexan shield to protect the lights from inadvertent contact or collision, which may result in damage. The lights shall be mounted vertically in each compartment where they will not interfere with adjustment or accessibility of any shelving or equipment.

Each light shall be sized accordingly to illuminate the compartment adequately.

## **COMPARTMENT OPEN LIGHT**

A large red light shall be mounted in the cab visible from the driver's and officer's seat.

Each compartment door shall be equipped with a door open indicator switch. When contact is broken at these switches, it shall activate the compartment open light in the cab.

## **ENGINE COMPARTMENT LIGHT**

There shall be one (1) light installed in the engine compartment to illuminate the engine area. There shall be a switch located adjacent to or on the light.

## **PUMP COMPARTMENT LIGHT**

There shall be one (1) light installed in the pump compartment to illuminate the pump house area. There shall be a switch located adjacent to or on the light.

## **GROUND AREA LIGHTING**

There shall be six (6) high intensity water resistant lights mounted under the unit to provide proper ground area illumination in areas designed for the personnel to climb onto or descend from the apparatus.

## **BATTERY CHARGING RECEPTACLE**

The battery charging receptacle location shall be adjacent to its respective battery system.

## **LIGHT BAR**

A Whelen model FN55VLED NFPA LED 55" light bar shall be installed on the cab roof of the unit. There unit shall contain a total of two (2) front corner linear 12's, four (4) front linear 8's, two (2) red and two (2) white, and two (2) end red linear 8's.

## **LOWER ZONE WARNING LIGHTS**

A Whelen NFPA 1901 lower zone warning light package shall be installed on the unit.

## **LOWER ZONE A WARNING LIGHTS (GRILL)**

There shall be two (2) 60R00FR 600 series L.E.D. surface mount lights mounted on the unit. The lights shall be mounted to the grill on the front of the chassis using cast aluminum housings. The lens color shall be red.

Flash Pattern shall be determined by the fire department.

### **LOWER ZONE B&D WARNING LIGHTS**

There shall be a total of six (6) 60R00FRR 600 series L.E.D. surface mount lights mounted on the unit. There shall be three (3) red 600 series L.E.D lights with mounted on each side in the lower half of the unit (zones B & D lower). One light shall be located at the front, another shall be midship, and the third shall be toward the rear of the apparatus. Cast aluminum housings shall be used in those locations where flush mounting is not available.

### **LOWER ZONE C WARNING LIGHTS**

There shall be two (2) 60R00FR 600 series L.E.D. surface mount lights mounted on the rear of the unit. The lights shall be surface mounted by use of the 6E flange on the rear lower half of the unit (zone C lower). The lens color shall be red.

Flash pattern shall be determined by the fire department.

### **UPPER ZONE B&D WARNING LIGHTS**

There shall be a total of four (4) 60F02FRR 600 series Super L.E.D. lights mounted on the unit in upper zones B&D. Two (2) red 600 series L.E.D. lights shall be mounted on each side in the upper half of the unit. One shall be mounted toward the front and one toward the rear of the apparatus.

### **UPPER ZONE C WARNING LIGHTS**

There shall be a total of two(2) 60F0@FRR 600 series Super L.E.D. lights mounted on the unit in upper zone C. There shall be one (1) red 600 series L.E.D. light mounted on each side of the rear of the apparatus. Two (2) additional 60R02FRR 600 series L.E.D. Lights shall be installed on each side of the rear of the apparatus in conjunction with the 600 series to meet compliant light levels.

### **ELECTRONIC SIREN**

There shall be one (1) Whelen model WS-295 electronic with noise canceling microphone shall be installed in the cab area.

### **SPEAKER**

There shall be one (1) Federal siren speaker model MS100 Dynamax installed on the front bumper of chassis.

### **AIR HORNS**

Provide and mount two (2) Grover emergency stutter tone horns to be mounted on either side of hood.

### **AIR HORN CONTROL**

The horns shall be activated by Linemaster brand Model 491-S floor switches. The switches shall be located one on each side of the driving compartment.

### **SCENE LIGHTS**

The unit shall be equipped with two (2) Whelen 810 series halogen lights. There shall be two (2) 810 series halogen lights located in the rear of the apparatus per fire department request.

### **SCENE LIGHTS ACTIVATED IN REVERSE**

The rear scene lights shall be activated when the unit is placed in reverse. This mode is in addition to the switches provided in the cab and/or at the lights.

## **120 VOLT & 240 VOLT**

Since the apparatus is equipped with a 120/240 volt electrical system, the wiring and associated equipment shall be tested.

The wiring and associated receptacles shall be subjected to a 1-min, 900-V dielectric voltage withstand test with any switches in the circuit(s) closed between live parts, including neutral and the vehicle frame. This test shall be conducted after all body work has been completed.

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

An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the test shall be recorded and provided to the purchaser at the time of delivery.

## **GENERATOR**

### **SMART POWER 10KW HEAVY RESCUE SERIES HYDRAULIC GENERATOR**

Smart Power, model HR-10, 10000 watt hydraulic generator shall be provided. The generator is designed specifically for mounting on top of the vehicle, at the customer-specified location, but can also be easily separated into its three major components (tray, cooler/fan assembly, and reservoir) for mounting in custom applications.

The generator system shall come with a standard 5 year/1,000 hour fully transferable warranty from the manufacturer.

The unit shall come equipped with: generator tray assembly (which includes the generator, hydraulic motor, cooler, fan, electronics package, 10 micron spin-on fluid filter and reservoir), axial piston hydraulic pump with pressure compensated control, and Command and Control Center (CCC) display with all required wiring harnesses. The CCC shall be an interactive operator control center, equipped with smart touch solid state buttons, with displays for voltage, frequency, amperage, hour meter, service reminders, operator warnings, system faults and diagnostics. Standard electronics package shall include smart start engagement to reduce mechanical stress, precise voltage and frequency control, cold start system, automatic load and temperature compensation, integrated diagnostics system, and other automated control features to protect system, vehicle and operator.

The generator tray assembly shall be delivered with the cooler/fan assembly mounted such that the hot air is exhausted straight up, through an NFPA approved walking grate.

The body of the generator tray assembly (including reservoir) shall be 32" long x 13.5" wide x 17" high, weighing approximately 220 pounds. The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

## Ratings and Capacity

Rating:	12000 watts peak 10000 watts continuous
Volts:	120/240 volts
Phase:	Single, 4 wire
Frequency:	60 Hz
Amperage:	83 amps @ 120 volts or 42 amps @ 240 volts
Engine speed at engagement:	Standard soft start feature allows for any speed engagement
Operation range:	850 to 3240 RPM

## Testing

The generator shall be tested in accordance with all current N.F.P.A. 1901 standards.

## Notes

\*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.

## OUTLETS

Four (4) duplex outlets shall be installed per the fire department request. Two (2) outlets shall be recessed in the body and be protected by a weatherproof cover. One (1) outlet shall be located in the L1 and in the R1 compartments.

All outlets are to be of the plug configuration used by the Fire Department.

## BREAKER BOX

The main breaker box shall be a Square D with twelve (12) circuit breaker rated to wire size and load demand. The circuit breaker panel shall be equipped with standard circuit breakers. Circuit breaker panel shall be installed on the rear (right) wall of L1 compartment. An engraved label shall be furnished next to breaker box to indicate switches and circuits.

## 120VOLT / 1500 WATT (2) FIRE RESEARCH FOCUS (PUSH UP)

There shall be a total of two (2) Fire Research FC530-M10-1000 Watt, 120 volt Focus low profile extendible lights installed per Fire Department instructions. Each light shall utilize the 530 side mount, bottom raise twist lock poles. Each pole uses the patented concentric locking mechanism. The twist lock cannot jam or be overtighten, and has no metal to metal contact.

There shall be two (2) Focus FC530-M10 push -up lights installed on the apparatus at the front of the body.

The lights shall be mounted in such a way to allow them to be operated and extended while on the truck and shall be located so as not to interfere with any other lights, doors, handles, or tilting of cab .

## **PAINT**

The body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments. Compartment doors will be painted separately to assure proper paint coverage on body, door jambs and door edges.

All painted surfaces shall follow the following procedure to insure a lasting finish.

Metal surfaces shall be sanded to remove all burrs and imperfections in aluminum, before etching and treatment.

A wax & grease solvent shall be used to clean and prep the aluminum surface. The surface shall then be rinsed with freshwater. This step removes wax, grease and other surface contaminants, thus leaving a bright, clean and conditioned surface.

A self-etching, aluminum primer shall be applied next. The self-etching primer shall fill all of the minor imperfections, scratches, etc. in the metal. This step produces a corrosion resisting conversion coating that fends off oxidation and other surface contaminants leaving a surface that gives excellent paint adhesion.

A sandable primer shall be sprayed on the metal, that seals the surface for the polyurethane paint. A minimum coating thickness of 2 mil shall be applied. Primer is then sanded smooth leaving the best surface for topcoat.

The apparatus body shall then be painted with a minimum of three (3) coats of high luster final finish polyurethane paint.

These steps are followed as recommended by the paint manufacturer to provide a lasting and high quality gloss finish. All paint products shall be provided by the same manufacture as the top coat finish.

The body shall be painted to match the (PAINT COLOR & CODE) supplied by the fire department.

## **STRIPE**

There shall be a 4" wide, white Scotchlite stripe located no higher than 48" from the ground installed on the apparatus cab and body. The stripe shall cover a minimum of fifty percent (50%) of perimeter of each side of the apparatus and fifty percent (50%) of the perimeter of the rear of the apparatus and twenty-five (25%) of the perimeter of the front of the apparatus. The department shall specify the exact location of the stripe.

## **WIRING SCHEMATICS**

A complete set of detailed electrical wiring schematics shall be provided with the completed unit. The schematic shall clearly labeled and describe all electrical circuits for an accurate reference.

## **SERVICE MANUAL AND PARTS LIST**

A service manual shall be provided with the completed unit. Manual shall include equipment and component information as well as warranty and service information.