

Town of Wascott
PO Box 159
Wascott, WI 54890

Specifications for a 2015 Fire Department Pumper

Information for Contractors

Sealed proposals are desired from reputable manufacturers of automotive fire apparatus in accordance with these specifications and with the advertisement, a copy of which is attached, for the piece of apparatus as follows:

Fire Truck, triple combination pumper, 1000 gallon per minute, hose body, booster tank, and all other appurtenances in accordance with the following:

GENERAL REQUIREMENTS

Each bid must be accompanied by bidders accurate written and detailed specifications covering the apparatus and equipment which it is proposing to furnish and to which the apparatus furnished under the Contract must conform. It is the intent of these specifications to cover the furnishing and delivering to the purchaser, complete apparatus equipped as specified. Minor details of construction and materials where not otherwise specified are left to the discretion of the Contractor who shall be solely responsible for the design and construction of all features. Such details and other construction not specifically covered herein or not at variance with these specifications should conform with the intent of the specifications as outlined in Booklet No. 1901 dated 2009.

The apparatus being furnished under these specifications shall conform to the requirements specific to initial attack fire apparatus NFPA Booklet 1901 version 2009. Any test equipment required or expense incurred for the Certification Tests shall be borne by the Contractor supplying this equipment.

RELIABILITY OF CONTRACTOR

Contractor shall furnish satisfactory evidence that he has the ability to design, engineer, and construct the apparatus specified and shall state the location of the factory where the apparatus is to be manufactured and tested. The apparatus design shall be an "original" generated by the Contractor/Bidder and not reproductions of fire/rescue apparatus designs previously engineered by other Contractors/Manufacturers.

DESIGN

The design of the equipment shall be in accordance with the best engineering practices. The equipment design and accessory installation shall permit accessibility for use, maintenance, and service. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks or other elements which might cause injury to personnel or equipment. NOTE: Where "nibbled" or non-continuous cutting methods are used to machine the body material, all edges shall be reworked/machine smoothed for injury prevention and appearance reasons.

All oil, hydraulic, and air tubing lines and electrical wiring shall be located in protective positions, properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members.

Parts and components shall be located or positioned for rapid and simple inspection and recognition of excessive wear or potential failure. Whenever functional layout of operating components determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be located for the best accessibility.

Cover plates which must be removed for component adjustment or part removal will be equipped with disconnect fastenings or hinged panels.

Drains, filler plugs, grease fittings, hydraulic lines, bleeders and check points for all components will be located so that they are readily accessible and do not require special tools for proper servicing. Design practices shall minimize the number of tools required for maintenance.

All components shall be designed and protected so that heavy rain or other adverse weather conditions will not interfere with normal servicing or operation.

All specified stainless steel shall be type 304, 2-B where used for exterior painted panels and #4-brushed where used for pump panel overlays and unpainted compartment and body panels. All specified smooth surface aluminum, where used for painted or machined swirl natural finish, shall be 5052-H32 alloy of the specified thickness. All 4-way aluminum tread plate shall be "polished" finish with NFPA approved pattern on walking and step surfaces, type 3003 of specified thickness. All specified bolted fasteners shall be coated stainless steel "low profile" button socket head cap screws. All nut fasteners to be Ny-Lok or approved equal, designed to prevent loosening. No substitute will be acceptable to stainless steel where specified.

NOTE: Lighter gauges of specified materials will not be acceptable.

The materials specified are considered absolute minimum. Exceptions to these material requirements will not be permitted since all raw materials of the specified type are available to all manufacturers. Since all fire apparatus manufacturers have the ability to shear, brake, and weld as these specifications require - all basic requirements must be complied with.

No exceptions will be allowed for stainless steel material and specified thickness requirements, since these materials are available to all fire/rescue apparatus manufacturers. Aluminum can not be substituted for any specified stainless fabrications.

Each Bidder shall be prepared, if so requested by the Purchaser, to present evidence of his design experience/capabilities and manufacturing ability to carry out the terms of the contract.

CONSTRUCTION METHODS, STAINLESS STEEL FABRICATIONS

Since any reputable original equipment manufacturer (OEM) of Fire Fighting Apparatus possesses the means and capability to provide the specified press-brake fabricated construction and bolted assembly method, the purchaser will ONLY consider proposals of such manufacture. Proposals' specifying weld-together stainless steel structural's or weld-together stainless steel fabrications do not meet the intent of this requirement and will be rejected. Furthermore, proposals that include the practice of mating or engaging stainless steel materials into structural aluminum extrusions will not be considered.

All proposals must be compliant to the specified sheet and plate stainless steel construction materials, including type of alloy, thickness, and surface finish.

Bidders will be required to demonstrate, by example of their previously delivered apparatus; precision of metal cut profiles, accuracy of fastener spacing, fit-and-finish of assembled fabrications, absence of imperfections in metal

finishing, and ease of which the assembled fabricated body components may be disassembled and removed for modifications, repairs or replacement.

The apparatus body assembly shall consist only of individual press-brake-formed structural fabrications, each of which is precisely machined from high quality 304 alloy stainless steel sheets, and assembled with integral 90-degree flanges at mating surfaces. All mating surfaces are to be assembled using the specified removable threaded fasteners. Bidders will be required to demonstrate: precision of metal cut profiles, fit-and-finish of assembled fabrications, and ease of which the assembled parts may be disassembled and removed for modifications, repairs or replacement.

Due to the requirement that the apparatus body be easily repairable, proposals that include the practice of stitch-welding, seam-welding, or plug-welding mating body fabrications shall not be submitted. Likewise, apparatus body designs that rely on metal fusion, adhesives, encapsulating welded extrusions, or non-removable fasteners, as a method of permanent assembly, or apparatus body designs and construction methods that have compartment modules welded to their understructures will not be considered.

NOTE: THERE SHALL BE NO STRUCTURALS USED TO FORM THE SHAPE OF AND SUBSEQUENTLY WELDED TO THE APPARATUS BODY COMPARTMENTS, THUS ALLOWING FOR PARTIAL OR COMPLETE DISASSEMBLY FOR REPAIRS.

TYPE 304 STAINLESS STEEL CONSTRUCTION MATERIALS - NO EXCEPTIONS

Since all manufacturers of Fire Fighting Apparatus have the means and ability to purchase and fabricate their compartmented bodies of Type 304 Stainless Steel, it is the only grade of stainless steel that will be accepted.

Apparatus proposals that incorporate lesser grades, or combinations of Type 304 and lesser grades of stainless steel, will not be considered.

SERVICEABILITY:

To insure the Purchaser a source of service and parts over a 25 year anticipated life of the apparatus, the Bidder shall provide factory service, fabrication/manufacturing, and testing facilities within a 150 mile radius of the Fire Department. This same facility must stock a complete line of all fire fighting equipment and parts for this apparatus. Records as to the purchase source for all auxiliary components of the specified apparatus shall be available to Purchaser upon request. This purchase information shall include manufacturer name, model number, authorized distributor, current part number, and special installation instructions.

PRINTED PROPOSALS

All proposals shall be submitted in typed format. casual, hand-written proposals shall be considered informal and immediately rejected and the bid will be returned in its entirety to manufacturer. The only handwriting acceptable on the proposal forms will be on the signature lines.

PROPOSAL SIGNATURES REQUIRED

All bids must be signed by the President of the manufacturer of the apparatus being proposed. Bids signed by a sales representative shall be declared informal and will be rejected. Each bid must give the full business address of the manufacturer. Bids by a Corporation must be authorized and signed by the President. Same signature is required on Bid Bond, if specified.

BID WITHDRAWALS

Bids may be withdrawn by certified mail or acknowledged facsimile request from Bidders prior to the time fixed for opening. Negligence on the part of the Bidder in preparing the Bid Proposal confers no right for the withdrawal of the Bid after it has been opened. No Bidder may withdraw their Bid after the time set for the opening thereof.

DETAILED PROPOSAL SPECIFICATIONS

All Bidders shall furnish complete "Proposal Specifications", printed on their own stationery, copies or reproduction of these "advertised specifications" can only be used as an attachment to the proposal specifications, for comparison/compliance purposes.

All Bid Proposal Specifications must be in the same sequence as these Advertised Specifications for ease of comparison. Any bid not in this sequence will be disregarded and rejected.

LETTER OF EXCEPTIONS

It is the intent of the Fire Department to receive proposals on equipment/apparatus meeting the attached detailed specifications in their entirety. Any proposals being submitted, without "Full Compliance" with the advertised specifications shall so state on the Bid Proposal Page, followed by a detailed "Letter of Exceptions" listing the areas of non-compliance and equipment or designs being substituted.

DELIVERY AND OPENING OF PROPOSAL

Each proposal and all papers bound and attached thereto, together with the proposal guarantee, shall be placed in an envelope and securely sealed therein. The envelope shall be marked "Bid on Fire Equipment".

Proposals will be received at or prior to the time set for the opening of bids. Proposals received after the "Bid Opening" will be returned unopened.

The bids will be opened publicly and read aloud at the time and date stated on the advertisement for bids.

CORPORATE OWNERSHIP OF MANUFACTURER

The manufacturer of the apparatus must be fully owned and managed by a Parent Company, Corporation, or Individual(s) that is 100% held by United States of America based Company, Corporation, or United States citizens(s).

Proposals from any manufacturer that is fully or partially owned and/or operated by a foreign company, Corporation or Individual(s) under any type of ownership, partnership, or any similar type of agreement will be immediately rejected.

INSURANCE REQUIREMENTS

Each Bidder must submit with their bid proposal a Certificate of Insurance listing the proposed manufacturer's product liability insurance coverage. Liability insurance shall be a minimum amount of \$11,000,000 million dollars with coverage attained with a minimum of \$1,000,000.00 underlying insurance and \$10,000,000.00 umbrella coverage. Submitted Certificate shall name the apparatus manufacturer, insurance company, policy number, and effective dates of the insurance policy. Bids submitted without the required Certificate, or for Certificates listing less than One (1) million dollars of underlying coverage, plus the Ten (10) million dollar umbrella coverage, will be considered non responsive and automatically rejected. No exceptions are allowed to the minimum insurance coverage requirement.

The manufacturer shall maintain full coverage on the purchaser's cab and chassis from time of first possession by the manufacturer until the apparatus is delivered and accepted by the purchaser. No exceptions. Purchaser reserves the right to require proof of insurance from the manufacturer's insurance carrier prior to entering into a contract for the apparatus.

PROPOSAL PRINT/DRAWING

Each Bid shall be submitted with a complete detailed print of the apparatus as is specified. The print shall be to scale, minimum of 1:30, of the exact apparatus being proposed, and not a stock print of a similar unit. All dimensions are subject to a +/- 1/4 inch tolerance. The print shall have complete views of the driver side with chassis cab, passenger side with chassis cab, and the rear of body. The print shall include all of the following depicted items:

CHASSIS: exact replication of model of chassis cab, air horns, chassis cab step housings, 120-volt shore power receptacle, air system keep-fill receptacle, emergency lighting fixtures, hand rails, and horizontal exhaust system outlet.

APPARATUS BODY: the apparatus body subframe, underbody tow eyes, water tank profile with baffles and suction sump, underbody folding wheel chocks, all exterior 4-way treadplate pattern areas, body access steps, hand rails, interior compartment shelving, emergency and non-emergency lighting fixtures, ladders and pike poles and storage area(s), hard suction hose and storage area(s), side and rear compartmentation showing dimensions and D-ring door hardware, / roll-up door slats/bundles/bar type handle/latches, and hosebed arrangement with dividers and grating material. / dividers, grating material, and hosebed covers.

PUMP ENCLOSURE & PUMP SYSTEM: pump enclosure/compartment, fire pump profile, fire pump transmission profile, tank-to-pump piping, preconnect hosebeds with hose guides, side pump panel removable sections, pump control and instrument panel layout with: gauges, instruments, pump controls, discharge outlets with closures, suction inlets with closures, and deluge discharge riser with monitor/device.

ADDITIONAL OPTIONAL FEATURES: other optional features, if specified, shall also be included on the proposal drawing, this includes; front bumper extension with attached accessories/treadplate gravel shield/preconnect hosebed, interior compartment roll-out trays, drop down ladder rack, rewind air/hydraulic/cord reels, SCBA bottle storage compartments/racks, cascade air storage bottles with fill station, generator installation, permanent quartz lighting, hand operated 120-Volt floodlighting, 120-volt exterior body receptacles, extendible light tower, and other detailed accessories and features so as to provide a "picture" of the proposed apparatus.

COMPLIANCE: this required drawing shall become a part of the Proposal. Failure to submit the above required drawing, with the sealed bid proposal, will cause immediate rejection of the bidder's proposal.

Quality and accuracy of Bidder's Proposal Drawing will be a major consideration, for determining of most acceptable proposal.

PHOTO DOCUMENTATION

Bidder shall refer to the following specifications and include any asked for photos, or drawings of required feature enhancements such as step modules, pump panel inserts, and etc., documenting they have provided these features in the past and are prepared to provide them as required for this Bid Proposal.

AWARD OF CONTRACT

The contract will be awarded, as soon as possible to the most "Responsible Bidder", provided their Bid is reasonable and it is in the best interest of the Fire Department. The purchaser reserves the right to waive any formality in bids received once such waiver is in the interest of the Purchaser. Also, to accept any item in the Bid, found to be of superior quality or otherwise preferred by the Purchaser.

The competency and responsibility of Bidders along with content of proposal specifications and accuracy/quality of proposal drawing will be considered in making the award. The Purchaser reserves the right to reject any or all Bids when such rejection is in the interest of the Purchaser and to reject the Bid of a Bidder who, in the judgment of the Purchaser, is not in a position to perform the contract. The Purchaser does not, in any way, obligate itself to accept the lowest or any Bid.

The Fire Department reserves the right to reject any or all Bid Proposals and purchase the equipment it prefers.

Bidders taking "Total Exception" to these advertised specifications are hereby advised that such statement will result in immediate REJECTION of the Bid Proposal.

Prior to award, the Bidder Representative will meet with purchasing officials (at Purchaser's location) to personally discuss all facets of these specifications to insure a complete and satisfactory understanding of the Purchaser's specifications and the Bidder's proposal.

STAINLESS STEEL REQUIREMENT

Bidder's experience with specified construction methods, and previous use of stainless steel as a construction material, will be considered in making the award. Bidder shall disclose the number of years they have been fabricating apparatus bodies, built entirely of Stainless Steel.

INSPECTION TRIPS

The Truck Committee members shall be advised as to the date of the following phases of construction: Pre-Construction (prior to bending of metal), Pre-Paint (final design/equipment layout), and Pre-Delivery. Truck Committee members reserve the right to travel to the factory during these stages of construction.

Bidder shall arrange for, and the Customer will pay the expenses of, the above specified "Pre-Construction Conference", to be held at the manufacturer's factory, at which time all final designs and equipment mounting locations will be approved. Any changes to original proposal specifications, as approved at the Pre-Construction Conference, shall be noted on a "revised specification", provided by the manufacturer and distributed to Truck Committee members within five working days after Pre-Construction Conference.

ACCEPTANCE TESTS AND REQUIREMENTS

Acceptance tests on behalf of the purchaser shall be prescribed and conducted prior to delivery or within 10 days after delivery, by the manufacturer's representative in the presence of such person or persons as the purchaser may designate in the requirements for delivery.

ALTITUDE REQUIREMENTS: The apparatus shall be designed to meet the specified rating at 2000 feet altitude above sea level.

ROADABILITY: The apparatus, when fully equipped and loaded per "Carrying Capacity", shall be capable of the following performance on dry/level/paved roads in good condition: From a standing start the vehicle shall attain a true speed of 35 MPH within 25 seconds. The vehicle shall attain a minimum top speed of 50 MPH. The apparatus shall be able to maintain a speed of at least 20 MPH on any grade up to and including 6%.

ROAD TESTS: Specified acceleration tests shall consist of two runs in opposite directions over the same route. From a standing start, through the gears, the vehicle shall attain a true speed of 35 mph within 25 seconds in the case of pumpers, and a true speed of 55 mph within 60 seconds.

The service brakes shall bring the fully laden apparatus to a complete stop from an initial speed of 20 MPH in a distance not exceeding 35 ft., on a substantially hard level surface road free from loose material, oil, or grease.

Manufacturer's pump test and independent third party pump certification tests shall be conducted by the apparatus manufacturer in accordance with requirements of NFPA #1901. A Certificate of Testing shall be furnished to the Purchaser, both for the Manufacturer's Preliminary Tests and the third party Certification Tests.

Responsibility for the apparatus and equipment shall remain with the contractor until acceptance by the purchaser.

The Manufacturer must supply at the time of delivery, a hard copy of:

1. Engine manufacturer's certified brake horsepower curve showing the maximum no-load governed speed.
2. Manufacturer's record of pumper construction details, per NFPA 1901.
3. Manufacturer's Run-In Certification with preliminary test results.
4. Pump Manufacturer's Certification of Hydrostatic Tests.
5. Pump Manufacturer's Certification of Pump Test Results.
6. The Certification of Inspection/Test of Fire Department Pumper by an Independent Third Party per NFPA 1901 standards.
7. Weight documents from four (4) individual certified scales showing actual loading on the sides of front axle, sides of rear axle(s), and overall (four total) vehicle (with the water tank full but without personnel, equipment, and hose) shall be supplied with the completed vehicle to determine compliance with NFPA section 10-1. Weights shall be for each tire or dual set of tires, so as to verify side-to-side loading, to be in compliance with NFPA section 4.12.2.3.3
8. At least two copies of the complete operation and maintenance manual covering the completed apparatus as delivered including the pump, emergency lighting and siren, generator, or other furnished accessories.
9. Wiring diagrams of 12-volt electrical systems, installed by apparatus body manufacturer (prime contractor). Diagrams must be "vehicle specific", describing all 12-volt electrical functions as furnished on this **and only this** apparatus.
10. A finalized drawing of apparatus as completed.
11. A "Delivery Manual", consisting of a 3-ring notebook type binder with reference tabs for each section, shall be furnished to include the following items: invoice copy(ies), proof of insurance, Manufacturer's Statement of Origin, acceptance forms, certifications, specifications, individual component manufacturer instructions and parts manuals, warranty forms for body, warranty forms for all major components, warranty instructions and format to be used for compliance with warranty obligations, routine service forms/publications, technical publications or training guide for major components, and apparatus body print "as built".
12. Paint numbers of all color coatings.
13. Certifications of water tank capacity.
14. Written load analysis of 12-volt electrical system as installed by body builder.

NOTE: Exceptions to the above requirements will not be acceptable.

A test data plate shall be provided at the pump operator's position which gives the rated discharges and pressures together with the speed of the engine as is determined by the manufacturer's test for this particular unit. Plate shall also include delivery date, pump serial number(s), original Customer, and the apparatus manufacturer's serial number.

The contractor shall affix a permanent plate in the driver's compartment specifying the quantity and type of fluids used in the vehicle:

All nameplates and instruction plates shall be metal or plastic with the information permanently engraved, stamped, or etched thereon. Metal nameplates to be installed with plated screws. All nameplates are to be mounted in a conspicuous place.

FAILURE TO MEET TESTS: In the event that the apparatus fails to meet the test requirements on first trials, a second trial may be made at the option of the Contractor, within thirty days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to make such changes as the Chief of the Fire Department and/or the purchaser may consider necessary to conform to any clause of the specifications within thirty days after notice is given to the Contractor to make such changes shall also be cause for rejection of the apparatus.

DELIVERY CONSTRUCTION PERIOD

The maximum period for construction of complete apparatus shall not exceed one hundred twenty (120) working days and shall include the time required for delivery of the chassis to the apparatus manufacturer. The contractor will not be held liable for delay of delivery caused by accidents, strikes, floods, or other events not subject to their control. Bidder shall specify on the required Bid Proposal Form the number of working days for completed delivery of the apparatus, from date of bid acceptance.

DELIVERY TO FIRE DEPARTMENT - NO EXCEPTIONS

The completed unit shall be delivered to the purchaser with full instructions provided to Fire Department personnel on operation, care, and maintenance of apparatus at the purchaser's fire station.

DELIVERY ENGINEER:

Delivery shall be performed by a factory trained Delivery Engineer only employed by the Bidder. Delivery Engineer shall remain in the community a reasonable time for training of Fire Department personnel and making normal adjustments.

Delivery shall be considered to include, but not be limited to:

- A. Transportation of the Fire Apparatus.
- B. Conducting day or evening classes for instruction of Fire Department personnel and Drivers for operation.

The Delivery Engineer shall be factory trained, fully capable of conducting informative classes on the complete operation of the vehicle. This means familiarity with engine, running gear, transmission, driving skill, as well as handling of pump equipment and all controls.

The Delivery Engineer shall set delivery and instruction schedule with the person appointed by Purchaser, recognizing the need for either daytime or evening classes. Advance notice of at least one (1) week will be given, advising the specific day on which the new apparatus will arrive.

The Purchaser shall make all housing arrangements for the Delivery Engineer and provide him with transportation to and from lodging and nearest available airport or rental car agency (if it applies). The cost of all housing and other living expenses are to be paid for by the Delivery Engineer.

PROGRESS PAYMENT

In order to eliminate interest and handling charges for the chassis portion, a "Progress Payment" shall be made upon receipt of chassis, at Bidder's factory. This amount shall be for an equivalent portion of the contract and is to be identified on the Bid Proposal page.

BALANCE PAYMENT TERMS

All Bidders shall be required to detail on the Proposal Page, and in their own exact words, the balance payment terms for said apparatus.

Final delivery price shall not include any Local, State, or Federal taxes. The Bidder shall not be liable for any State or Federally mandated tax or program after the sale of this apparatus.

GENERAL WARRANTY

The new fire Pumper apparatus manufactured per these specifications shall be warranted for a period of ONE (1) year from the date of delivery, except for chassis and other components noted herein.

Under this warranty, Bidder agrees to furnish any parts to replace those that have failed due to defective material or workmanship where there is no indication of abuse, neglect, unusual or other than normal service providing that such parts are, at the option of the Bidder, made available for inspection upon request, returned to Bidder's factory or other location designated by Bidder with transportation prepaid within 30 days after the date of failure or within ONE (1) year from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to defective material or workmanship. Accessories/components warranted by their original manufacturer may be subject to reinstallation charges under the terms of their respective warranties, especially if such warranties exceed the above 1-year warranty terms.

The warranty on the chassis and chassis supplied components, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the chassis manufacturer by the Purchaser.

This warranty will not apply to any fire apparatus which has been repaired or altered outside the Manufacturer factory or designated facility in any way, which, in the manufacturer's opinion might affect its stability or reliability. Each warranty claim needing repair or service at the designated facility must receive pre authorization by Manufacturer prior to performance of any work.

This warranty will not apply to those items which are usually considered to be normal maintenance and upkeep services: including, but not limited to, normal lubrication or proper adjustment or minor auxiliary pumps or reels.

Refer to the "FIRE PUMP" section and "BOOSTER TANK" section for specific extended Manufacturer's warranties on the provided Fire Pump and Water (Foam) Tank(s).

This warranty is in lieu of all other warranties, expressed or implied, all other representations to the original purchaser, and all other obligations or liabilities, including liabilities for incidental or consequential damage on Bidder's part. Without limiting the foregoing, any express or implied warranties of merchantability or fitness for a particular purpose or warranties arising by Customer usage or by operation of law with regard to any products delivered pursuant hereto are

expressly disclaimed. Bidder neither assumes nor authorizes any person to assume for Bidder, any liability in connection with the sales of Bidder's apparatus unless made in writing by the Bidder.

15-YEAR WARRANTY ON STAINLESS STEEL BODY FABRICATIONS

The fire apparatus manufacturer (body builder) shall warrant to the original purchaser only, that the stainless steel body components as fabricated by the body builder, under normal use and with reasonable maintenance, be structurally sound and shall remain free from corrosion perforation for a period of FIFTEEN (15) years.

This warranty does not apply to the following items which are covered by a separate warranty: paint finish, hardware, moldings, and other accessories attached to this body.

FIRE APPARATUS MANUFACTURER MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE STAINLESS STEEL BODY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

The fire apparatus manufacturer (body builder) shall replace, without charge, repair at the factory, or make a fair allowance for any defect in material or workmanship demonstrated to the satisfaction to have existed at the time of delivery or not due to misuse, negligence, or accident. If the body builder elects to repair the body, the extend of such repair shall be determined solely by the body builder, and shall be performed solely at the body builder's factory, or at an approved facility. The expense of any transportation to or from such repair facility shall be borne by the purchaser and is not an item covered under this warranty.

The fire apparatus manufacturer (body builder) shall not be liable for consequential damages and under no circumstances shall its liability exceed the price for a defective body. The remedies set forth herein are exclusive and in substitution for all other remedies to which the purchaser would otherwise be entitled.

The fire apparatus manufacturer (body builder) shall be given a reasonable opportunity to investigate all claims. The purchaser must commence any action arising out of, based upon or relating to agreement or the breach thereof, within twelve months from the date the cause of the action occurred.

5-YEAR APPARATUS PAINT WARRANTY

The five (5) year paint performance guarantee will cover the areas of the vehicle as are originally finished by the apparatus body manufacturer with the specified product for a period of FIVE (5) years beginning the day the vehicle is delivered to the purchaser.

The areas as outlined on the Guarantee Certificate, will be covered for the following paint failures:

GUARANTEE INCLUSIONS:

FULL APPARATUS BODY:

- * Peeling or delamination of the topcoat and/or other layers of paint.
- * Cracking or checking
- * Loss of gloss caused by cracking, checking, or hazing.
- * Any paint failure caused by defective finishes which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original owner.

The warranty on the chassis paint is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the chassis manufacturer by the Purchaser. Where painted shutter style doors are provided the warranty is limited to that which is provided by the manufacturer thereof.

LIFETIME SUB-FRAME WARRANTY - STAINLESS STEEL

The specified tubular stainless steel apparatus body sub frame shall be warranted to the original owner, for the vehicle lifetime, against cracks, corrosion and rubber isolator deterioration.

2-YEAR WARRANTY - ELECTRICAL SYSTEM - 12 VOLT DC

The Apparatus 12-volt DC Electrical System (exclusive of chassis) shall be covered, by the apparatus manufacturer (bidder) under normal use with normal service and maintenance, for a period of two (2) years, of which one (1) year is for Parts & Labor, and two years is for Parts Only. This warranty shall cover: Power Distribution System (PDC), Looms and Harnesses, Multi-Pin Connectors, and Workmanship as provided by the apparatus manufacturer. Individual emergency and non emergency electrical devices, light fixtures, audible equipment, intercoms, and motors shall be covered by the prevailing manufacturer's warranty.

LIFETIME WARRANTY - WATER TANK

The water tank, and its installed accessories, shall be covered by a "Lifetime" Warranty, against cracks, corrosion, or other failures caused by the tanks design and normal use of the same. The warranty shall be between the tank manufacturer, and the customer.

LIFETIME WARRANTY - FOAM TANK

The foam reservoir/tank, and its installed accessories, shall be covered by a "Lifetime" Warranty, against cracks, corrosion, or other failures caused by the tanks design and normal use of the same. The warranty shall be between the tank manufacturer, and the customer.

HALE STANDARD 5-YEAR PARTS / 2 YEAR LABOR WARRANTY

The specified Hale fire pump and Hale accessories shall carry the standard Hale five (5) year warranty covering defective parts and labor for two years (or 2000 hours usage starting from the date the original buyer takes delivery) and Covers Parts Only for an additional three years. (not labor).

Refer to above "Fire Pump System" section for furnished pump manuals.

PUMP PLUMBING WARRANTY

The stainless steel plumbing components and ancillary brass fittings used in the construction of the water/foam plumbing system shall be warranted for a period of ten (10) years or 100,000 miles. This covers structural failures caused by defective design or workmanship, or perforation caused by internal or external corrosion, provided the apparatus pumping system is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten (10) years from the date of delivery.

Additionally, labor to replace defective components and fittings will be covered for a period of One (1) year beyond the delivery date.

COMMERCIAL STYLE CHASSIS

The following specified commercial chassis shall be furnished, by the apparatus body builder, and included in the total Bid Proposal Package.

Model: 2015 Ford F-550 Super Duty XLT DRW, 4x4
Cab Type: Regular Cab
Cab to Axle: 84"
GVWR: 19,500 lbs. (Pay-Load Plus Package)
Engine: 6.7 Liter Power Stroke Diesel
300 Horse Power @ 2800 RPM
660 Lb.-Ft. Torque @ 1600 RPM
32 Valves
16.20 to 1 Compression Ratio
Transmission: Six speed automatic with overdrive w/PTO provisions
Transfer Case: ESOF - (electronic shift on the fly)
Fuel Capacity: 40 gallons
Batteries: Two (2), heavy-duty 750 CCA
Alternators: Dual HD (357 Amp Combined)
Brakes: 4-wheel ABS disc
Axles: Front - 7000 lb rating
Rear - 13,500 lb, 4.88 ratio limited slip
Steering: Power steering with tilt wheel
Wheels/Tires: Six (6), 225/70R19.5G steel belted radials,

NOTE: ORDER CHASSIS WITH BASE MODEL TIRE IF SUPER SINGLE OPTION IS SELECTED

with Steel rims

Instrument Panel: - LCD odometer
- Oil pressure warning light
- Transmission temperature gauge
- Temperature gauge
- Fuel level gauge w/ indicator lights
Radio: AM/FM stereo and digital clock
Driver's Seat: 40/20/40 - Cloth
Other options: - XLT trim package
- Front bumper with jewel headlamps
- Chrome grille
- Rear stabilizer bar

- Dual electric horns
- Driver and passenger side air bags
- Power windows w/ tinted safety glass
- Telescoping mirrors, day/night mirrors
- Power door locks
- Engine block heater
- Black vinyl floor mat
- License plate bracket
- Molded black cab steps
- Low deflection package
- Hi Cap trailer tow package
- Trailer brake controller
- Fire EMS package
- Oxford WHITE paint
- Operator command regeneration

MODIFICATIONS TO CHASSIS, AS TO BE PROVIDED BY BODY BUILDER:

The following special modifications are to be made by the fire apparatus body builder/manufacturer, to the specified fire apparatus truck cab and chassis.

NFPA RELATED STANDARDS:

GROUND CLEARANCE STANDARDS

Axle housings are to clear the road surface by at least 8" and an angle of departure of at least 8 degrees is to be maintained at rear of the vehicle when fully loaded.

VISIBLE WARNING DEVICE AND PLACARDS

The specified "Door Ajar" indicator light is to be mounted inside chassis cab so as to be visible to the driver.

A permanent sign that states "Occupants Must Be Seated And Belted When Apparatus Is In Motion" is to be provided. The sign is to be visible from each seated position. Additionally, an accident prevention sign is to be located at the rear step area of the vehicle to warn personnel that standing on the step while the vehicle is in motion is prohibited.

CHASSIS MODIFICATIONS: SUPER DUTY CHASSIS APPLICATION:

SUSPENSION AND FRAME CORROSION PROTECTION

Rear axle suspension brackets, left and right sides, front and rear, shall be caulked with silicone sealant preventing build-up of road salts and moisture that may cause future corrosion of bracket-to-frame-rail attachment points.

FRAME RAIL MOUNTING PROCEDURE

All chassis frame rail mounted brackets, supports, pump flanges, and apparatus body subframe components will be bolted to the frame rail sides. No holes will be drilled in the frame flanges, only the web will be drilled. No welding will be allowed to the chassis frame, web, or flanges, ahead of the rear most spring shackles. Frame flange sandwich clamping devices will not be used.

ROLLOVER STABILITY - NFPA 1901:

The apparatus must meet the rollover stability criteria defined in NFPA 1901 2009 Edition, and is to be verified with a “certified” Tilt-table Test performed at the body builder’s factory; or the vehicle is to be equipped with a stability control system (such as ESC) to be in accordance with this same NFPA standard.

FLUID DATA LABEL

A permanent data label shall be affixed in the driver's compartment specifying quantity and type of the following fluids used in the vehicle.

1. Engine Oil
2. Engine Coolant
3. Chassis Transmission Fluid
4. Pump Transmission Lubrication Fluid
5. Pump Primer Fluid
6. Drive Axle Lubrication Fluid
7. Air Conditioning Refrigerant
8. Air Conditioning lubrication oil
9. Power Steering Fluid
10. Front Tire Cold Pressure
11. Rear Tire Cold Pressure

NO RIDE LABEL

A label shall be located on the vehicle at the rear step area that shall warn personnel that riding on these areas while the vehicle is in motion is prohibited.

SEATING/OCCUPANCY LABEL

A label shall be installed in the cab to denote the exact number of passengers to be carried in the chassis cab and/or crew cab.

ACCIDENT PREVENTION LABEL

A placard is to be placed in the cab, visible to all occupants, to read: **ALL OCCUPANTS MUST BE SEATED AND BELTED WHEN THE APPARATUS IS IN MOTION**

GATED INLET WARNING SIGN(S)

At any gated suction inlets, a permanent label shall be provided to read: "WARNING - SERIOUS INJURY OF DEATH COULD OCCUR IF INLET IS SUPPLIED BY A PRESSURIZED SOURCE - WHEN VALVE IS CLOSED"

OVERALL HEIGHT/WIDTH/LENGTH/WEIGHT DATA PLATE

There shall be a high-visibility placard located in direct view of the seated Driver, which shall indicate, in feet-and-inches; the overall height of the vehicle (to the highest permanent point-except antennas), the overall width (at steps, fenders, and rubrails-not retractable mirrors), and overall length of vehicle (bumper to tailboard). The data plate shall also indicate, in pounds, the vehicle's total "as delivered" weight.

The dimensions and weight shall be "as manufactured", and the customer must revise the data plate, if they so change the height (by permanent loading and accessory equipment/device installations), and the weight by adding loose equipment, products, and supplies.

2012 COMPLIANT DPF/DEF EXHAUST SYSTEM

The original equipment chassis engine DPF/DEF (diesel particulate filter/diesel exhaust fluid) exhaust system, upstream and downstream of the passenger side outlet, shall remain unaltered (not modified), so as to remain in compliance with 2010 exhaust emission standards. The apparatus body design and accessory installations may have to be compromised, in order to prevent interference with the exhaust system components. Fabricated stainless steel heat deflector plates are to be provided, where necessary, to protect body manufacturer installed components from excessive radiant heat. Exhaust outlet shall terminate below body compartment floor rearward of rear wheels on passenger side of vehicle.

AIR INTAKE EMBER SEPARATOR

The chassis engine air intake system shall be equipped with an intake screen or filter provided by chassis manufacture that will block particulate matter larger than 0.039" from reaching the air filter element, to prevent ignition of the same.

UREA FILL ACCESS DOOR & CUBBY, DRIVER SIDE FORWARD WHEEL WELL

A Cast Products or equivalent brushed aluminum leading edge vertically hinged fuel fill door with recessed metal cubby is to be furnished, bolted in position, in the rearward location of the driver side apparatus body wheelwell panel. "UREA EXHAUST ADDITIVE ONLY" blue (color) nametag is to be furnished, on the interior door.

The OEM furnished "blue" rotary-locking Urea fill cap is to be installed in the fuel fill cubby. The OEM Urea fill hose and Urea vent hose assemblies are to be installed, extending from the cubby to the underbody diesel tank.

FUEL FILL ACCESS DOOR & CUBBY, DRIVER SIDE REARWARD WHEEL WELL

A Cast Products or equivalent brushed aluminum leading edge vertically hinged fuel fill door with recessed metal cubby is to be furnished, bolted in position, in the rearward location of the driver side apparatus body wheelwell panel. "LOW SULFUR DIESEL FUEL ONLY" green (color) nametag is to be furnished, on the interior door.

The OEM furnished "green" rotary-locking fuel fill cap is to be installed in the fuel fill cubby. The OEM fuel fill hose and fuel vent hose assemblies are to be installed, extending from the cubby to the underbody diesel tank.

BALL GATED COOLANT LINES: AUXILIARY HEATER(S)

Engine cooling system chassis cab heater return-to-engine line shall be separated and equipped with a Class-1 1/2" i.d. bronze quarter-turn ball type gate valve and 5/8" i.d. neoprene rubber heater hose extending to specified auxiliary heater(s). An additional 1/2" bronze quarter-turn ball gate valve is to be provided on the auxiliary heater(s)-to-engine return line. Gate valves shall allow complete shut-off of the chassis cab and remote auxiliary heating system(s) that are downstream of the chassis cab heater. Gate valves shall prevent hot water circulation during warm weather periods, and allow shut-down should a hose or heater core leak develop. Ball valve control handles shall have recessed nameplate describing function.

COOLANT "BOOST" PUMP, REAR FIRE PUMP APPLICATION

The specified rear fire pump compartment auxiliary heater core shall be piped to the engine coolant system, installation to include: 12-volt in-line Groco "free-flow" centrifugal cast bronze bodied coolant "boost" pump, parallel run of high grade coolant hoses with stainless steel screw type hose clamps, and chassis cab mounted toggle switch control with engraved nameplate to read: "COOLANT PUMP", accessible to driver. Installation of coolant pump shall provide increased rate of

coolant flow to assure maximum available chassis cab and rear pump enclosure auxiliary heater core temperatures during extreme winter conditions.

TIRE PRESSURE WARNING DEVICE, LED CAPS FOR 4 TIRES

There shall be a VECSAFE LED, tire alert pressure management system provided that shall monitor each tire's pressure. A chrome plated brass sensor shall be provided on the valve stem of each tire for a total of four (4) tires. The sensor shall activate an integral battery operated LED when the pressure of a tire drops 8 psi, from the nominal pressure when the cap was installed. Removing the cap from the sensor shall indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED shall immediately start blinking.

MUD FLAPS

Driver's side and passenger's side front fender and rear body wheel well mud flaps shall be furnished, made of fabric reinforced neoprene rubber, bolted to the front fender liner and rear wheel well bulkheads using stainless steel strap brackets and bolts. Mud flaps shall extend approximately 10" below running board level.

ELECTRICAL CONSOLE, BETWEEN FRONT SEATS

A custom-built, fabricated aluminum, electrical accessory console shall be furnished, installed inside the chassis cab, between front driver's and officer's seats. Console to be of "all-bolted-construction" (to allow for future modifications), maximum width, with horizontal back top surface same height as driver's and officer's seat bottom cushions, and forward "raised" sloping surface. Horizontal and sloping top surfaces of electrical console shall accommodate Customer's 2-way radio control head, the specified emergency lighting rocker switch panel, electronic siren control, and other specified accessory controls. Underside interior of console shall accommodate the wiring bundles, connectors, and circuit protection devices. Console to be unpainted aluminum, provided with a sanded finish.

The aluminum console shall include map storage pockets. The console shall be designed to meet the individual requirements of the customer. Layout of switches, etc. shall be finalized at the drawing approval meeting.

APPARATUS ELECTRICAL, 12-VOLT DISCONNECT, KEY ACTIVATED

The chassis ignition switch "on" position shall activate a heavy duty Kissling 300 amp solenoid, which powers the apparatus equipment, to include, but not be limited to: pump start motor, reel rewind motor(s), emergency lighting and non emergency body and/or scene lighting.

FIRE PUMP SYSTEM

HALE SINGLE-STAGE END SUCTION FIRE PUMP

A 1000 gallon per minute, Hale model RMB, single-stage "end suction" high-capacity centrifugal fire truck pump shall be furnished, mounted "rear centerline" of the vehicle immediately behind the water tank. The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance. Pump transmission to be gear box style with "cut-spur" chrome nickel steel gears. Pump shall deliver the percentage of rated capacity at discharge pressures indicated below:

- 100 percent of rated capacity at 100 pounds net pressure
- 70 percent of rated capacity at 150 pounds net pressure
- 50 percent of rated capacity at 200 pounds net pressure

The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2069 bar). All metal 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 vertically split, on a single plane for easy removal of entire impeller assembly including clearance rings. Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

PUMP TESTING

The entire pump shall be assembled and tested at the pump manufacturer's factory. Pump shall be tested by Hale, hydrodynamically at above pressure and capacities, and hydrostatically at a pressure of 600 psig. Certification by Hale shall be provided in delivery manual.

Apparatus Manufacturer's pump performance test to be performed after construction. Factory certification to be provided in delivery manual.

DATA & LUBE PLATES

The pump shall be provided with a metal plate giving the rated flow at "capacity" and "pressure" test pressures, together with the RPM of the engine at those pressures and deliveries, and mounted in clear view of the pump operator's panel. Test plate shall also indicate pump serial number, engine governed speed, and pump mode of operation for all four individual pump rating tests.

A permanently mounted metal lube plate shall be furnished, located inside driver's compartment, specifying the quantity and type of the following fluids (where applicable) as used in this pumper apparatus:

MANUALS

Two (2), instruction manuals to be provided upon delivery of the apparatus. Manuals to be pump model and serial number specific, to include but not be limited to operation instructions, maintenance (lubrication), and illustrated parts breakdown.

PUMP FEATURES

Additional pump features shall include: a hard, fine grade bronze impeller of the mixed flow design, accurately machined, hand-ground and individually balanced. The vanes of the impeller intake eye shall be hand ground and polished to a sharp edge, and 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. The pump impeller shaft shall be electric furnace heat-treated, corrosion resistant stainless steel. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

All pump control linkage rods to be heavily cadmium plated, equipped with threaded adjustable clevis joints or swivel ball joints one end and chrome plated or black phenolic control handles outboard end.

GEAR STYLE "SPLIT-SHAFT" MGA PUMP TRANSMISSION AND DRIVELINE

A Hale model MGA heavy duty 16,000 pound-foot torque rated gearbox pump drive transmission is to be furnished for high torque engine applications. The MGA transmission drive unit is to be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature. The gearbox drive shafts are to be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts, and are to withstand the full torque of the engine. All gears, both drive and pump, are to be of highest quality electric furnace chrome nickel steel. Bores are to 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 spur design is to be provided to eliminate all possible end thrust. The pump transmission ratio is to be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

Input and output split-shaft transmission drive multiple bolt companion flanges are to be furnished, torque capacity compatible with the vehicle's driveline.

PUMP SEAL

"Mechanical" pump seal assemblies to be furnished, with the specified centrifugal pump, self-adjusting type, maintenance free.

TRANSMISSION LOCK-UP

The direct gear (1:1 ratio) transmission lock-up for the fire pump operation shall engage automatically when the pump shift control, in the cab, is activated.

HALE PUMP SHIFT MANUAL

The fire pump shift assembly shall be provided with a cable style manual shift, with control located in the chassis cab .

PUMP TEST DATA LABEL

The pump control panel is to be provided with a printed data field indicating the rated flow at 150, 165, 200 and 250 test pressures, together with the RPM of the engine at those pressures and deliveries. Test Label is to be mounted in clear view of the pump operator's position, as per NFPA 1901 compliance.

Test label is to also indicate the following information:

Pump Make and Model

Pump Capacity

Apparatus Date of Manufacture

Apparatus Model Designation

Apparatus Serial Number

Apparatus Production Number

Engine Governed Speed

Pump Transmission Gear Ratio (to Engine)

Data field is to be permanently encased in a chrome full surround bezel.

GATED INLET WARNING LABEL(S)

At any gated suction inlets, a permanent label is to be provided to read: "WARNING - DEATH OR SERIOUS INJURY COULD OCCUR IF PROPER OPERATING PROCEDURES ARE NOT FOLLOWED".

AUXILIARY COOLING SYSTEM-GATED

A supplementary heat exchanger system shall be installed on the apparatus. The heat exchanger shall be installed inside the pump or engine compartment, controlled from the pump operator's panel, and labeled to identify its operation. The heat exchanger system shall be so designed as to allow for cold water from the discharge side of the fire pump to circulate through the heat exchanger tubes. The mixing of discharge water and radiator anti-freeze in the chassis engine shall not occur as the heat exchanger is a closed system. Piping from the fire pump to the heat exchanger, and return (to pump Master Drain suction port), shall be with high pressure line. Pressure line (from pump discharge) to be gated, with a Class-1 1/4-turn 3/8" ball valve control on pump control panel, with instructional nameplate.

HALE MULTIPLE PORT MANIFOLD DRAIN

Hale manifold drain valve, with bronze body will be furnished installed inside pump compartment. Drain valve to be mounted in lowest portion of pump compartment, piped with high pressure nylon tubing, to low points of water pump suction and discharge cavities to allow simultaneous draining through a single drain valve.

Drain valve to be model 107370 (12-Port) "screw type" with universal joint and driver side exterior pump panel control.

INTAKE RELIEF VALVE, 2-1/2" BRONZE

An Elkhart bronze pump suction intake relief valve shall be furnished, installed inside pump compartment, flange bolted or threaded to suction cavity of the fire pump. Valve to be of the pre-set (to 125 psi) adjustable bypass design, to dump below the vehicle excessive inlet water pressure. Relief valve to be accessible for future adjustment of bypass pressure.

INTAKE RELIEF VALVE, WITH DISCHARGE TO BELOW PUMP MODULE

The specified fire pump suction manifold Intake Relief Valve's outlet is to discharge down, to below the pump module (same as pump drain valve).

PRESSURE GOVERNOR and MONITORING DISPLAY

Fire Research PumpBoss model PBA400-A00 pressure governor and monitoring display kit is to be provided and installed. The kit is to include a control module, pressure sensor, and cables. The control module case is to be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 3/4" deep. Inputs for monitored information shall be from a J1939 data bus or independent sensors. Outputs for engine control shall be on the J1939 data bus or engine specific wiring.

FUNCTION INDICATORS

The following continuous displays shall be provided:

- CHECK ENGINE and STOP ENGINE warning LEDs
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Engine OIL PRESSURE; shown on an LED bar graph display in 10 psi increments
- Engine TEMPERATURE; shown on an LED bar graph display in 10 degree increments
- BATTERY VOLTAGE; shown on an LED bar graph display in 0.5 volt increments
- PSI / RPM setting; shown on a dot matrix message display
- PSI and RPM mode LEDs
- THROTTLE READY LED.

MESSAGE DISPLAY

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator.

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory.

Stored elapsed hours shall be displayed at the push of a button.

It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Engine RPM
- High Transmission Temperature
- Low Battery Voltage (Engine Off)

- Low Battery Voltage (Engine Running)
- High Battery Voltage
- Low Engine Oil Pressure
- High Engine Coolant Temperature

CONTROL MODES

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A control knob that uses optical technology shall adjust pressure or RPM settings. It shall be 2" in diameter with no mechanical stops, a serrated grip, and have a red idle push button in the center.

THROTTLE INDICATOR

A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle.

PRESSURE CONTROL

In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator.

ENGINE RPM CONTROL

In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase.

The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

ENGINE APPLICATION

The pressure governor and monitoring display shall be programmed for Cummins IS series engines.

LOCATION

Location of the governor and monitoring display shall be at pump operator's panel.

PRIMER PERFORMANCE REQUIREMENTS

The pump shall be capable of taking suction and discharging water with a lift of 10 ft. in not more than 30 seconds with the pump dry, through 20 ft. of suction hose of appropriate size. It shall be capable of developing a vacuum of 22" at an altitude of up to 1000 ft.

WATEROUS VPOS PUMP PRIMER

A high capacity positive displacement self lubricating priming system is to be furnished, consisting of: a Waterous VPO "oil-less" rotary vane priming pump with 12-volt electric motor drive, and a and push-button priming valve control on pump operator's panel. Priming pump is to be mounted beneath fire pump, with bottom water and lubricant discharge directed to the ground.

WATEROUS VAP VACCUM ACTIVATED PRIMING VALVE

There shall be a Waterous model VPA vacuum activated priming valve supplied with the pump. The valve shall open automatically when the priming system is activated. The valve shall be installed on the pump or mounted remotely.

WATEROUS OIL LUBRICATED SYSTEM

A 5-quart oil reservoir is to be provided, piped to the priming pump housing, for oil lubrication of the rotary vane pump. Primer oil reservoir mounting location is to allow for easy access to check level and refill.

PRE-PRIME - REAR SUCTION

A rear suction inlet "pre-prime" system shall be furnished, consisting of: one (1) remote mounted electric priming valve assembly, non-collapsible vacuum hose between priming valve and above specified priming pump, non-collapsible vacuum hose between priming valve and rear suction inlet (upstream of gate valve), and operator's panel mounted push button control with nameplate. Installation of this priming valve assembly shall allow "pre-priming" of the rear suction with its gate valve closed.

HEAT ENCLOSURE, ALUMINUM

A removable heater casing is to be provided, completely enclosing the under side of the fire pump compartment module. Heater casing side and end panels are to be fabricated entirely of natural finish smooth sheet aluminum, bolted to and easily removable from the bottom perimeter of the pump module. So as to allow maximum ground clearance, the heater casing shall of the minimum depth required to enclose the pump and its accessories. Two (2) individual smooth aluminum slide-out bottom panels are to be provided, criss-cross reinforced with drain holes and ¼-turn butterfly clamp latch, removal of which allows for inspection of and access to the fire pump.

HOT WATER TYPE PUMP COMPARTMENT HEATER

A 35,000 BTU Badger R-295-0 or equivalent hot water type automotive heater to be furnished and installed inside pump compartment. Heater installation to include: gated engine coolant feed and return lines, dual 12-volt electric fans, and fan control located on pump control panel.

PUMP HEATER HOSES AND CLAMPS

The hot water heater core feed and return lines shall be minimum 3/4" i.d. rubber construction.

Hose clamps are to be screw-to-tighten style, constructed of non corrosive material.

HALE STANDARD 5-YEAR PARTS / 2 YEAR LABOR WARRANTY

The specified Hale fire pump and Hale accessories shall carry the standard Hale five (5) year warranty covering defective parts and labor for two years (or 2000 hours usage starting from the date the original buyer takes delivery) and Covers Parts Only for an additional three years. (not labor).

Refer to above "Fire Pump System" section for furnished pump manuals.

PUMP TEST. PRELIMINARY AND FINAL CERTIFICATION TESTING

After a "preliminary" apparatus factory performance test, the above specified pump test/certification is to be performed by apparatus manufacturer and "witnessed" by an independent third party as per NFPA 1901 pumping standards, with proper serialized certification provided upon apparatus delivery.

"ROUND TUBULAR" HIGH-FLOW SUCTION MANIFOLD PIPING

A stainless steel "high-flow" round tubular suction manifold shall be furnished, flange bolted or Victaulic coupled to and easily removable from, the fire pump's volute suction inlet. All auxiliary side threaded taps and/or Victaulic risers shall be "coped" to conform to radius of larger size waterway, so as to provide unsurpassed flow characteristics.

NOTE: Due to the poor flow characteristics, a suction manifold fabricated of square or rectangular tubing with flat-mount weld spuds and/or riser pipes for auxiliary suction taps, is not an acceptable substitute to a tubular manifold.

The suction manifold itself shall contain multiple Victaulic and threaded outlet ports, to facilitate the installation of all the specified gated suction(s), tank-to-pump suction(s) line, and intake relief valve.

Heavy wall threaded stainless steel pipe and pipe fittings shall be used, wherever possible, upstream of the specified 2-1/2" suction valves.

All suction manifolds and fittings, suction valves, tubing's, and hoseline assemblies shall be pressure tested after installation.

PUMP SUCTION INLETS

Following specified pump manifold inlets shall be of proper inside diameter for rated pump capacity, equipped with zinc die cast screens so as to provide cathode protection for pump waterways.

All intakes shall be provided with suitable closures capable of withstanding 500 psi, threaded caps shall be chrome plated brass, rocker lug 3" and smaller, long handled larger than 3".

SUCTION INLET VALVE STANDARDS (WHERE OPTIONALLY SPECIFIED)

Following optionally specified 3" or larger gated intakes (except the tank-to-pump intake) shall include a remote controlled valve mechanism that shall not permit changing the position of the flow regulating element of the valve from full close to full open, or vice versa, in less than 3 seconds. Where air type actuators are employed, they shall include dual (2-each) adjustable needle valve restrictors, bench set/tested, so as to facilitate the slow movement. Where manual gear or electric gear style actuators are employed, the crank or motor shall regulate movement speed.

SHORT SUCTION TUBE

The specified side pump suction inlet(s) shall be of minimum length to allow for exterior stacking of adapters or pre-connected hose.

INLET BLEEDER VALVES

Where specified, each gated intake shall be equipped with a bleeder valve located inside pump compartment (inside rear compartment-for rear suction), upstream gate valve, with remote bleeder control in close proximity to the intake. The gated inlet bleeders shall consist of: 3/4" high pressure flexible hose assemblies extending between suction valve and bleeder valve, 3/4" cast bronze or stainless steel bleeder valve, exterior bleeder valve control handle, and an engraved or printed identification label. Bleeder controls for side gated inlets are to be located below the inlet, in a single row immediately above the runningboard/floor level. Bleeder controls for optionally specified rear inlets are to be located below the inlet, above the tailboard level. The bleeder valves shall be rotating quarter-turn style equipped with rectangular chrome plated control handles, which are horizontal when closed.

HOSE THREADS

Where specified, all screw-on/off threads shall be NST (National Standard Threads), all "sexless" couplings shall be Storz.

SELF BLEEDING SUCTION CAPS

The specified "threaded" suction caps shall be the VLH Class-1, Trident or equivalent which incorporates a cross-machined thread design to automatically relief stored pressure in the line during un-capping.

DISCHARGE LINE OUTLET VALVES - WATEROUS

All 2-1/2" and 3-1/2" discharge "line coupling" outlets shall be equipped with Waterous brand, ball style, in-line valves. The valves shall be equipped with stainless steel or chrome plated brass ball and a "spring-loaded" seal assembly. No lubrication or regular maintenance shall be required on the Waterous valves.

REAR SUCTION

PUMP INTAKE ADAPTER

The rear mounted end suction fire pump's rear suction intake adapter shall be appropriate size for the specified pump rating, configured for use with specified rear suction inlet fitting(s). Intake adapter shall be flanged or of Victaulic style, to allow for removal of rear suction piping (upstream of pump body), intake relief valve, specified gate valve(s), tank-to-pump piping, and other optionally specified inlet fittings.

REAR SUCTION INLET, GATED 6": 6" NST CHROME CAP

One (1), rear gated pump suction intake to be provided with: 6" chrome long handled cap, 6" NST male stainless steel inlet adapter, 6" zinc removable strainer, 3/4" bronze bleeder valve located inboard rear body panel with remote control handle, 6" Weco or equal butterfly gate valve with crank actuator (inboard pump compartment) and exterior pump panel hand wheel control with revolving handle, 6" ASA flanges, and Victaulic clamp coupler. Inlet shall have minimum extension outboard the rear pump panel. NOTE: The inlet piping, downstream of the butterfly valve, shall have accommodations for the specified pump intake relief valve, 500 GPM water tank-to-pump line, and any specified auxiliary pump suction.

GATED REAR SUCTION INTAKE RELIEF VALVE

A Class-1 stainless steel rear suction intake relief valve shall be furnished installed on specified rear suction piping (upstream of the rear suction gate valve), located inside rear pump compartment. Intake relief valve to be of the pre-set adjustable bypass design, mounted so as to self-drain, and furnished with appropriate discharge piping to dump below the vehicle any excessive rear suction inlet water pressure.

TANK-TO-PUMP CONNECTIONS

WATEROUS 3-1/2" TANK-TO-PUMP VALVE

A 3-1/2" Waterous 1/4-turn ball style tank-to-pump valve to be furnished. The gated suction line from specified water tank suction sump to the tank suction valve shall be furnished with a banded flexible "hump hose" connection, and at least 4" i.d. stainless steel piping within the fire pump compartment. Hump hose shall be "upstream" of the specified check valve, to prevent pressurizing of the hose connection. Tank-to-pump suction shall allow a flow rate exceeding 600 GPM.

NOTE: PVC tank-to-pump piping is not acceptable.

TANK-TO-PUMP CHECK VALVE

A 4" i.d. bronze corrosion resistant tank-to-pump suction check valve is to be furnished, 600 GPM flow capable, to prevent "back-flow" of water from the pump-to-tank if the tank suction valve is inadvertently left open.

WATER TANK-TO-PUMP CONTROL, "PULL TO OPEN"

Specified tank-to-pump suction valve is to be remote controlled with lever style valve actuator and a manual push-pull style T-handle twist-to-lock operator's panel control. Tank-to-pump suction valve control is to be "In-Closed" and "Out-Open".

TANK REFILL, 1-1/2" ROTARY VALVE

One (1), gated 1-1/2" tank fill discharge line, from pressure side of fire pump to water tank to be provided with: tank fill spud located at top front of water tank, high pressure wire reinforced 1-1/2" hose with reusable threaded end couplings, 1-1/2" NRS bronze screw-type valve and pump operator's panel mounted screw type fluted control knob. Tank fill valve to be of the screw-type so that it can be throttled and used as a bypass or pump cooling line. Control nameplate to read: "TANK FILL - PUMP COOLING".

INDUSTRIAL PUMP DISCHARGE OUTLET CONTROLS AND ACTUATORS

All discharge valves shall have operating controls and actuators that allow the valve to be positioned incrementally from closed to full open, and locked in any selected position. Each valve control is to be adjacent to its respective pressure instrument.

Each of the specified 3" diameter or larger discharge valves are to have an operating mechanism which shall not permit changing the position of the flow regulating element of the valve from full close to full open, or vice versa, in less than 3 seconds.

DISCHARGE OUTLET BLEEDERS

Each of the following specified gated discharges shall be equipped with a "discharge outlet bleeder". The outlet bleeders shall consist of: 3/4" high pressure flexible hose assemblies extending between discharge valve and bleeder valve, 3/4" cast bronze or stainless steel bleeder valve mounted interior of pump compartment (inside rear compartment-for rear discharges), and an exterior bleeder valve control handle with color coded (to match corresponding discharge outlet) engraved or printed identification label. Bleeder controls for side discharges are to be located below the outlet, in a single row immediately above the runningboard/floor level. Bleeder controls for optionally specified rear discharges are to be located below the outlet, above the tailboard level. The bleeder valves shall be rotating quarter-turn style equipped with rectangular chrome plated control handles, which are horizontal when closed.

HOSE THREADS

Where specified, all screw-on/off threads shall be NST (National Standard Threads), all "sexless" couplings shall be Storz.

"ROUND TUBULAR" STAINLESS STEEL DISCHARGE MANIFOLD

A stainless steel "round tubular" discharge manifold shall be furnished, flange bolted or Victaulic clamped to and easily removable from, the fire pump's large diameter discharge outlet taps.

NOTE: Due to the likelihood of high pressure deformation (regardless of wall thickness), manifolds fabricated of square or rectangular tubing's, are not acceptable.

The tubular manifolds main waterway shall be commensurate in diameter, to adequately feed the quantity and size of auxiliary discharge line "branches". So as to provide unsurpassed flow characteristics, all auxiliary branch reducers shall be concentric bell reducers, and all couplings and risers shall be "coped" to conform to the radius of the larger sized feed waterway. All capped ends shall be spherical for high pressure applications. Flat-mount weld spuds and non-coped risers welded to rectangular fabrications and/or end plates are not acceptable.

All stainless steel welding shall be TIG, to assure proper penetration and conformity with original tubing and weld fittings outside diameters. All elbows shall be smooth sweep weld fittings. Mitered angle joints are not acceptable.

Under no conditions shall there be weld slag, misalignment of tubing sections, or projections into any tributaries of the manifold.

See following specifications describing the number/size/locations of outlet gate valves to be furnished.

Heavy wall threaded pipe and pipe fittings shall be used, wherever possible, downstream of the specified side outlet and top deluge discharge valves.

All flexible discharge lines and bleeder lines, downstream of respective valves, shall be reinforced high pressure hose assemblies with stainless steel or brass end fittings.

Pressure gauge tubing lines shall be clear polypropylene with brass fittings, manifold drain lines (that are not high pressure hose assemblies) shall be copper tubing.

All discharge manifolds and fittings, suction manifolds and fittings, discharge and suction valves, tubing's, and hoseline assemblies shall be pressure tested after installation.

PASSENGER SIDE DISCHARGE(S)

PASSENGER SIDE 2-1/2" DISCHARGE

One (1), passenger's side 2-1/2" gated discharge to be provided with: 2-1/2" NST chrome plated brass rocker lug cap with chain, 2-1/2" NST male x 2-1/2" NST rocker lug swivel female 45 degree chrome plated brass elbow outlet extension, 2-1/2" NST male chrome plated brass outlet adapter, 3/4" bleeder valve and hose assembly, 2-1/2" i.d. stainless steel pipe nipple, 2-1/2" Waterous 1/4-turn discharge valve with chrome plated ball and spring loaded self-adjusting seal assembly (located inside pump enclosure), and push-pull chrome "locking-style" discharge control handle located on the pump operator's control panel.

REAR DISCHARGE(S)

REAR PASSENGER SIDE 2-1/2" DISCHARGE

One (1), rear (passenger's side) 2-1/2" gated discharge to be provided with: 2-1/2" NST chrome plated brass rocker lug cap with chain, 2-1/2" NST male x 2-1/2" NST rocker lug swivel female 30 degree chrome plated brass elbow extension, 2-1/2" NST male chrome plated brass outlet adapter, 3/4" bleeder valve with exterior remote control, 2-1/2" i.d. stainless steel pipe or wire reinforced hose assembly with 2-1/2" stainless end fittings, 2-1/2" Waterous 1/4-turn discharge valve with chrome plated ball and spring loaded self-adjusting seal assembly (located inside pump compartment), and push-pull chrome "twist-to-lock" discharge control handle with recessed color coded nameplate located on the pump operator's control panel.

REAR PASSENGER SIDE 2-1/2" DISCHARGE LOCATED ON CONTROL PANEL

The above specified rear passenger's side 2-1/2" gated discharge is to be located on the recessed rear operators control panel, inboard of the optionally specified access door.

REAR DRIVER SIDE 2-1/2" DISCHARGE

One (1), rear (driver's side) 2-1/2" gated discharge to be provided with: 2-1/2" NST chrome plated brass rocker lug cap with chain, 2-1/2" NST male x 2-1/2" NST rocker lug swivel female 30 degree chrome plated brass elbow extension, 2-1/2" NST male chrome plated brass outlet adapter, 3/4" bleeder valve with exterior remote control, 2-1/2" i.d. stainless steel pipe or wire reinforced hose assembly with 2-1/2" stainless end fittings, 2-1/2" Waterous 1/4-turn discharge valve with chrome plated ball and spring loaded self-adjusting seal assembly (located inside pump compartment), and push-pull chrome "twist-to-lock" discharge control handle with recessed color coded nameplate located on the pump operator's control panel

REAR DRIVER SIDE 2-1/2" DISCHARGE LOCATED ON CONTROL PANEL

The above specified rear driver's side 2-1/2" gated discharge is to be located on the recessed rear operators control panel, inboard of the optionally specified access door.

HOSEBED DISCHARGE(S)

PASSENGER SIDE OUTBOARD, 2-1/2" DISCHARGE, 2-1/2" SWIVEL OUTLET

One (1), passenger side outboard hosebed preconnect, 2-1/2" gated discharge to be provided with: 2-1/2" NST male x 2-1/2" female 90 degree bronze swivel "underside" discharge outlet (extending through slotted opening in the hosebed floor), bronze preconnect hoseline bleeder valve, 2-1/2" i.d. wire reinforced hose with 2-1/2" NPT and victaulic stainless end fittings, 2-1/2" Waterous 1/4-turn discharge valve with chrome plated ball and spring loaded self-adjusting seal assembly (located inside pump enclosure), and push-pull chrome "twist-to-lock" discharge control handle with recessed color coded nameplate located on the pump operator's control panel.

PASSENGER SIDE INBOARD, 2-1/2" DISCHARGE, 1-1/2" SWIVEL OUTLET

One (1), passenger side inboard hosebed preconnect, 2-1/2" gated discharge to be provided with: 1 1/2" NST male x 2" female 90 degree bronze swivel "underside" discharge outlet (extending through slotted opening in the hosebed floor), bronze preconnect hoseline bleeder valve, 2" i.d. wire reinforced hose with 2" NPT and victaulic stainless end fittings, 2-1/2" Waterous 1/4-turn discharge valve with chrome plated ball and spring loaded self-adjusting seal assembly (located inside pump enclosure), and push-pull chrome "twist-to-lock" discharge control handle with recessed color coded nameplate located on the pump operator's control panel.

SELF-BLEEDING DISCHARGE CAPS, AND ELBOWS

Where specified, the rocker lug discharge caps and outlet elbow extensions are to be VLH, Class-1, Trident, or equivalent which incorporates a cross-machined thread design to automatically relieve stored pressure in the line during uncapping/unthreading.

HOSE REEL DISCHARGE(S)

HOSE REEL 1" DISCHARGE

One (1) booster hose reel(s) 1" gated discharge to be provided, each with: 1" i.d. high pressure wire reinforced discharge hose extending from hose reel inlet to hose reel discharge valve, one (1), 1" ball style 1/4-turn full flow bronze bodied self-locking discharge valve (located inside pump compartment), and push-pull chrome "twist-to-lock" discharge control handle with recessed color coded nameplate located on the pump operator's control panel.

PUMP AIR BLOW-OUT LINE

One (1), 1/4" i.d. hose reel "blow-out" air line(s) to be furnished, each to include: pump panel mounted Class One 3/8" 1/4-turn blow-out valve, and necessary 1/4" nylon air line piping to a point immediately down stream of specific suction

and discharge valves. Blow-out system to be piped to a pump panel mounted male air hose connection, with a manual emergency shut-off valve located inside pump compartment, a one-way check valve located upstream blow-out valve.

HANNAY REEL

One (1), Hannay electric rewind type 1" i.d. booster hose reel to be furnished. Reel is to be steel construction with 12-volt electric motor rewind and friction brake. Electric rewind push button switch to be furnished, located adjacent to hose reel per Customer approval.

MOUNTING LOCATION

Reel is to be permanently mounted interior of the passenger side upper pump enclosure. Hose reel is to be positioned above the fire pump system, with deployment available to the passenger side of vehicle.

HOSE

To Be provided by customer

NOZZLE

To Be provided by customer

4-WAY HOSE ROLLER GUIDES

One (1) each chrome and polished stainless steel 4-way "encapsulated" hose roller assembly(ies) are to be furnished outboard of the hose reel, providing roller guide for booster hose deployment. Each roller assembly shall consist of four (4) chrome corner brackets, two (2) vertical, and two (2) horizontal 1-1/4" diameter stainless steel roller tubes with end bearings. Width of encapsulated opening shall be the same as or greater than the width between hose reel discs.

FIRE PUMP COMPARTMENT

The fire pump location shall be at the rear of the apparatus, its features and accessories as follows:

3D ENGINEERED REAR PUMP ENCLOSURE

The following specified "rear" fire pump enclosure (compartment) is to be "fully engineered" as an integral part of the compartmentd apparatus body, with ALL structural fabrications, pump inlet/outlet panels, pump control panel, gauge/instrument panel, hose beds/trays, and fire pump mounting brackets are to be computer three-dimensional modeled and on-screen assembled. Each individual pump module component's part profile is to be traceable to a precision engineered digital drawing.

In addition to the part profile and fabrication details, the precision engineering is to include the mounting and fastener holes to allow the assembly of all related fire pump compartment components, including but not limited to:gauges and instrumentation, pump drain and bleeder controls, pump discharge and suction valve controls, handrail bracket and step mount holes, and all other accessories which are to be bolted to the pump module.

REAR CENTERLINE PUMP ENCLOSURE, REAR "ENCLOSED" CONTROLS

A rear centerline of body pump compartment/enclosure shall be furnished, between back walls of the apparatus body rear side compartments (rear of water tank and wheel well housings), ahead of specified rear tailboard. Pump compartment to provide full enclosure of the pump and its related plumbing and valves. The floor of hosebed shall provide top of pump

enclosure, the specified rear control panel shall provide back enclosure, and the specified heat casing shall provide bottom enclosure.

Service and inspection to the rear mounted pump shall be through the specified removable rear side compartment back wall inserts, removable overhead panel insert (below hosebed floor), and removable bottom heat enclosure.

The specified rear pump control panel shall be recessed at least 9" inboard the roll-up rear door, allowing for discharge outlet and suction inlet extensions with mounted caps.

An R.O.M. brand bar latched satin anodized shutter type roll-up rear body/pump panel access door, shall be furnished, extending full width between the vertical rear body corners. Door roll-up mechanism and opened door bundle shall be located above the specified rear pump panel light housing, encapsulated for protection. Exterior rear top door header to be fabricated of or plated with the specified rear body material, providing a scuff resistant surface below the hosebed and between rear body corners.

REMOVABLE SIDE COMPARTMENT BACK WALL INSERTS, FOR PUMP ACCESS

The driver and passenger rear side compartment interior back walls are each to be furnished with a flush insert panel of maximum allowable size, removal of which provides access to the interior of pump compartment for pump service, inspection and repairs. Insert are to be of the same material as surrounding wall, flush mounted to the wall surface, and equipped with multiple flush mounted bright metal trigger latches. Removable inserts are to be in vertical alignment with the rear interior pump system, to allow generous access to the fire pump and its plumbing accessories.

Use of the specified trigger latches is to allow insert panel removal without the need for hand tools.

PUMP MOUNTING: REAR VOLUTE STYLE PUMP & MID-SHIP PUMP TRANSMISSION

The specified end-suction volute style rear mount pump system is to be independently mounted to a transverse heavy plate steel channel fabricated platform, which itself is bolted to and easily removable from the chassis frame rails. All assembly bolts to be Grade-8, with locking style removable nut fasteners. Design of transverse pump mounting platform is to allow for rigid support of pump and piping assemblies, as well as ease of pump's removal from the vehicle.

The specified split-shaft pump transmission is to be separately and independently mounted to transverse heavy steel plate fabricated brackets, which are bolted to and easily removable from a mid-ship location between the chassis frame rails. All assembly bolts to be Grade-8, with locking style removable nut fasteners. Design of transverse mounting bracket is to allow for rigid support of pump transmission, at the chassis-matching driveline angle, and ease of transmission's removal from beneath the vehicle.

Pump mounting brackets and pump transmission mounting brackets are to be primer painted and urethane painted, color to match the chassis frame rails.

LOWER LEVEL DRIVELINE, SPICER 1710/1760 SERIES

Spicer 1710/1760 series lower level driveline components are to be furnished, ahead of and behind the pump transmission, arranged to facilitate pump transmission installation between vehicle transmission and rear axle. Lower level driveline components are to include: slip stub shafts, slip yokes, and cross & bearings to be compatible with pump end yokes and OEM chassis driveline. replacement and/or modified OEM drivelines are to be high speed balanced.

UPPER LEVEL DRIVELINE, SPICER 1410/1480 SERIES

Spicer 1410/1480 series upper level driveline components are to be furnished, to the rear of the pump transmission, extending to the fire pump impeller shaft. Upper level driveline components are to include: slip stub shafts, slip yokes,

cross & bearings, intermediate support bearings, and constant velocity joint as may be necessary to provide smooth high-speed power transmission to the rear mounted fire pump. The upper level drivelines are to be high speed balanced.

UPPER LEVEL DRIVELINE GREASE LUBRICATED PILLOW BLOCK BEARING SHAFT

In addition to the upper driveline cross bearings, slip yoke, slip stub shaft, heavy wall tubing, one or more mid-section solid shaft double pillow block bearing shaft assembly(ies) to be provided. Solid shaft and pillow block bearings are to allow for "off-setting" (re-alignment) of the driveline to enhance driveline angularity.

Pillow block bearing shaft(s) to be grease lubricated, serviced from a remote location using high pressure nylon tubing extending from the bearing housing to individual multiple remote grease zerks.

REAR PUMP CONTROL PANEL

REAR PUMP CONTROLS

The pump operator's control panel shall be located at "rear" of vehicle. All pump discharge controls are to be mounted on the pump operator's control panel, so as to permit operation from one central operator's location. All mechanical pump actuator rods, both rotating and push-pull, are to be heavily cadmium plated solid cold roll steel. Push-pull rods are to be equipped with clevis joints or swivel ball joints which are thread mounted to rods, allowing for stroke adjustment. Discharge valve and discharge outlet bleeder control handles are to be chrome plated brass or polished stainless steel. All manual push-pull discharge valve controls shall be straight-pull, with quarter-turn twist-to-lock hand grips.

The upper portion of the pump control panel shall accommodate the specified "opening" instrument panel, the mid-level shall accommodate the valve and accessory controls, and the bottom portion shall accommodate the specified inlet and outlet bleeder and drain valve controls.

IDENTIFICATION TAGS

All discharge controls and outlets, suction controls and inlets, drain valve controls, bleeder valve controls, and all other pump related controls shall be properly identified with permanent engraved or cast nameplates describing function and operation of each control. Nameplates for discharge controls, discharge outlets, and respective pressure gauges are to be color coded and shall indicate: numerical sequence, location of outlet, type of discharge, and size of hose to be used. The nameplates shall be permanently attached to the discharge control hand grips and discharge and suction drain and bleeder control handles.

Where air or electric toggle switch suction gate valve controls and position indicator lights are specified, they shall be grouped together, for ease of identification, and provided with permanently engraved nameplates recessed into surround bezels.

SIDE MOUNT VALVE CONTROLS

Six (6) Innovative Controls brand chrome plated, side mount push-pull controls, with ergonomically designed chrome plated T-handles, and encapsulated UV-resistant printed color-coded (ILO engraved) verbiage labels shall be furnished.

DISCHARGE CONTROL NAME PLATES

The specified individual discharge control engraved color coded identification name plate's nomenclature shall, describe: the physical location of outlet, the size of hose to be attached, and the type of discharge. Where an outlet is Foam Capable, the name plate shall so describe.

DISCHARGE OUTLET NAME PLATES

Individual Discharge Outlet name plates are to be provided adjacent to the outlet or hosebed. Outlet name plates are to be of the same color as the discharge valve control name plate, pressure instrument/gauge name plate, and the bleeder valve control name plate.

ENCLOSED REAR PUMP CONTROL PANEL

The pump operator's control panel shall be located at the centerline rear of body, inboard the specified rear roll up door. Pump control panel shall be fabricated of or overlaid with #4 brushed-polished stainless steel, providing a scuff resistant non-painted corrosion free surface.

All pump discharge and suction controls are to be mounted on this rear pump operator's control panel, so as to permit operation of the pump from one central location. All side mechanical pump control rods, rotating and push-pull, shall be heavily cadmium plated solid cold roll steel, equipped with adjustable clevis joints or swivel ball joints and chrome plated brass or black phenolic control handles/knobs. All discharge controls and outlets, suction controls and inlets, drain valve controls, bleeder valve controls, and all other pump related controls shall be properly identified with permanent engraved or cast nameplates describing function and operation of each control. Nameplates for discharge controls, discharge outlets, and respective pressure gauges shall be color coded and indicate: numerical sequence, location of outlet, type of discharge, and size of hose to be used.

The specified air toggle switch controls with indicator lights shall be grouped together on pump control console, equipped with permanently engraved nameplates recessed into a single piece polished stainless steel surround bezel.

PUMP PANEL LIGHTING

Pump control panel lighting is to be provided by the specified interior compartment lights, which are activated by door-open switch.

PRESSURE GAUGES/INSTRUMENTS ALIGNED WITH DISCHARGE CONTROLS

The specified pump panel mounted discharge controls are to be located adjacent to or immediately below and inline with corresponding individual discharge pressure gauge. The pump operator's control panel is to be configured in an organized manner, "user-friendly", side-to-side across the entire panel.

PUMP ENCLOSURE WIRING HARNESSSES

All pump compartment (Pump Cavity) wiring for specified 12-volt electrical equipment is to be suitably protected inside heat resistant vinyl, forming one or more wiring harness(es). Harnesses are to originate at a dedicated Pump Cavity PDC (power distribution center) located within the rear pump enclosure, extend to the individual electrical devices, and secured with loom clips. Harness individual wires are to be legend imprinted multi-stranded copper, SAE-J 1128 automotive compliant. Spare wires are to be provided, so as to allow for future installations of additional electrical accessories.

All 12-volt switches, relays, terminals, connectors, and wiring to have a direct current rating of 125% of maximum current for which the current is protected. All wiring terminals to be closed barrel style, mechanically crimped, and insulated

PUMP MODE TRANSMISSION LOCK-UP

Vehicle electronic automatic transmission to be "signaled" by shifting of the fire pump into pump gear, so as to activate transmission "Lock-Up" mode (direct drive). An automatic transmission shift selector position detent or transparent removable shield is to be provided to prevent unintentional movement of the shift selector during pumping operations.

PUMP CAVITY POWER DISTRIBUTION CENTER

A fabricated metal power distribution center (PDC) is to be provided, located interior of the rear pump cavity/enclosure, accessible from an access door or removable panel. PDC is to contain engineered electrical components and pin/socket bulkhead connectors. Multiple circuit breaker sockets shall be furnished for future use.

PUMP CAVITY WIRING SCHEMATICS

Vehicle Specific wiring information is to be provided for this particular apparatus "as configured" upon completed delivery of the same. Information is to be in a drawing format, describing origination and termination connections and functions.

PUMP COMPARTMENT LIGHT, LED

One (1), clear lens 4" round grommet mount 12-volt LED interior pump compartment light to be furnished, mounted beneath the ceiling of interior pump module. Light to be activated by setting of the Park Brake.

PUMP GAUGE PANEL

PUMP GAUGE & INSTRUMENT LAYOUT

The specified pump pressure gauges and engine monitors/instruments shall be installed in a "grouped" area of the specified pump operator's control panel, located above the rear mount pump controls.

Top light housing to be furnished for optionally specified light fixture(s).

PUMP OPERATOR'S INSTRUMENTS AND GAUGES

ENGINE INSTRUMENTATION

The engine instrumentation is to be included in the specified fire pump pressure control system "engine governor". Instrumentation shall be integral with the Governor Control.

COLOR CODED DISCHARGE NAMEPLATES: NOMENCLATURE

Discharge name plates and/or control diagrams are to be permanently engraved into colored media or encapsulated color coded printing, as specified below. Name plate colors are to match the designated color of the individual outlets and pressure instruments.

Suction name plates are to be of the same single color, contrasting to the discharge colors

The name plate's nomenclature is to identify: physical location, size of hose to be attached, and type of discharge. Example: REAR PASSENGER SIDE 2-1/2" PRECONNECT DISCHARGE

Color matching name plates are to be provided for: Discharge Outlet (or Hosebed Pre-Connect), Discharge Control, Discharge Pressure Instrument, and the Discharge Bleeder Control.

Apparatus locations are to be identified as: FRONT (forward facing), PASSENGER SIDE (curb side facing), REAR (rearward facing), and DRIVER SIDE (street side facing).

On sides of apparatus, left-to-right locations are to be identified as FORWARD and REARWARD.

At rear of apparatus, locations are to be identified as INBOARD, OUTBOARD, OR CENTER.

NOTE: The terms LEFT and RIGHT are not to be utilized, unless specifically instructed to do so by customer.

COLOR CODED DISCHARGE AND SUCTION NAME PLATES

The name plates, as provided for identification of the following devices, are to be permanently printed on a colored background with nomenclature as specified above, attached with permanent adhesive. NOTE: Name plates are not to be screwed or riveted in position.

Color matching name plates are to be provided for: Suction Inlet, Suction Control (when gated), Suction Bleeder, Discharge Outlet, Discharge Control, Discharge Pressure Instrument, and Discharge Bleeder Control.

MASTER GAUGES, VACUUM & PRESSURE NO-SHOK LIQUID FILLED GAUGES

Master pump intake and pump discharge pressure indicating devices shall be located within 8" of each other, edge to edge, with the intake (suction) pressure indicating device to the left of the pump discharge pressure indicating device.

A 4" diameter NoShok compound style pressure gauge to be furnished, registering 0 x 600 psi, "**enhanced**" black numerals on white background. Gauge needle shall have a "bright orange" tip for improved visibility. Gauge to be piped to discharge volute of fire pump, equipped with a black permanently engraved identification nameplate installed below the gauge, to read: "DISCHARGE."

A 4" diameter NoShok compound style pressure gauge to be furnished, registering -30 x 400 psi, "**enhanced**" black numerals on white background. Gauge needle shall have a "bright orange" tip for improved visibility. Gauge to be piped to suction volute of fire pump, equipped with a black permanently engraved identification nameplate installed below the gauge, to read: "SUCTION."

TEST GAUGE PANEL

A test plug assembly to be furnished, installed on specified gauge panel adjacent to respective pump suction and pump discharge gauge. Test plugs to be piped to pump suction cavity and discharge cavity using high pressure clear nylon tubing with brass fittings.

INDIVIDUAL DISCHARGE GAUGES, 2-1/2" DIAMETER

Six (6), 2-1/2" diameter NoShok compound style discharge pressure gauges to be furnished, registering 0 x 400 psi, "**enhanced**" black numerals on white background. Gauge needle shall have a "bright orange" tip for improved visibility. Gauges to be located in a uniform manner no more than 6" from its respective discharge valve control.

Each gauge and respective discharge valve control to be equipped with color coded permanently engraved identification nameplate to describe numerical sequence, location, type and size of outlet.

All above specified pressure gauges to be analog style, liquid filled, vibration dampened, and capable of operations to -40 degrees F. Master gauges and individual discharge pressure gauges shall have a 7 year warranty.

The specified engine monitors, pump suction and discharge gauges, and individual gated discharge pressure gauges shall be installed on the specified gauge panel.

Pressure gauges to be piped to the individual discharge valves and pump suction and discharge volutes using high pressure clear nylon tubing with brass fittings.

CAST METAL PRESSURE GAUGE SURROUND BEZELS

The specified individual pump discharge, pump intake, and individual discharge pressure gauges shall be encased/surrounded by chrome or polished trim bezels. Color coded placards/name tags are to be recessed into the gauge trim bezels.

TANK LEVEL INDICATOR(S)

WATER LEVEL INDICATOR - TANK VISION

One (1), FRC, "Tankvision" WLA200-A00 water tank level indicator to be furnished with: weatherproof encapsulated high intensity LED light indicator, tank level sending unit, and protected wiring loom. Water tank level indicator to be mounted on pump control panel. Tank level sensing unit to be located front of specified water tank to properly sense water capacity.

POLY WATER TANK -- LIFETIME WARRANTED - 300 WATER

The apparatus shall be equipped with a 300 gallon water capacity polypropylene thermoplastic water tank.

The tank body and end bulkheads shall be constructed of 1/2" thick, polypropylene, nitrogen-welded and tested inside and out. Tank construction shall conform to NFPA standards.

The transverse and longitudinal 3/8" thick swash partitions shall be interlocked and welded to each other as well as to the walls of the tank. The partitions shall be designed and equipped with vent holes to permit air and liquid movement between compartments.

The 1/2" thick cover shall be recessed 3/8" from the top of the side walls. Hold down dowels shall extend through and be welded to both the covers and the transverse partitions, providing rigidity during fast fill operations. Drilled and tapped holes for lifting eyes shall be provided in the top area of the booter tank.

The bottom of the tank shall be secured within the specified rubber lined "full perimeter cradle" as described below, design to be in accordance with the tank manufacturer's requirements.

The water fill tower shall be designed, sized and located as required by the needs of the tank. The 1/2" thick polypropylene fill and overflow tower shall be equipped with a hinged lid and a removable polypropylene screen. The water fill tower shall be surrounded by a metal fabrication, providing separation from the hosebed.

A tank fill inlet shall be provided, minimum 2" i.d. with interior tank deflector to break-up the discharge water stream.

An overflow tube shall be installed within the fill tower and internally piped with large diameter schedule 40 PVC pipe through the tank, exiting behind the vehicle's rear axle.

The water tank sump shall be a minimum of 10" x 10" x 3" deep and located on the bottom of the booster tank booster tank. There shall be a 4" i.d. schedule 40 polypropylene tank suction pipe from the entrance of the tank (adjacent to and inline with fire pump) to the tank sump. The tank drain and clean out shall be 3" NPT schedule 80 female flange with plug, located in the bottom of the tank sump.

WARRANTY

The booster tank shall have a lifetime warranty as provided by the tank manufacturer.

WATER TANK SUPPORT STRUCTURE

The specified water tank is to be nested into a full perimeter mounting "picture frame" style support structure consisting of 2" x 2" x 1/4" thick 304 grade stainless steel angle. The front of tank is to be equipped with a full width 1/4" thick front base plate. All stainless's cradle res are to be wire-feed welded to the specified stainless steel apparatus body sub frame transverse tubings.

Structure is to be tank-specific, and shall provide support in the areas and locations specified by the tank manufacturer.

All mating areas between tank and structure are to be lined with 60 DURO rubber cushion material, 1/2" thick on horizontal and front surfaces and 1/4" thick on sides and back vertical surfaces.

Structure is to be mounted to chassis frame rail side walls by hardened carriage bolts. The use of threaded rod plates or u-bolts will not be considered adequate.

TANK CRADLE STRUCTURE WARRANTY

The tank cradle is to have a lifetime warranty, as provided by body builder.

RECTANGULAR SHAPE TANK

The specified water tank is to be of a conventional rectangular shape, located beneath the main hose bed, rearward of the front body transverse cross-panel.

The tank bottom is to be T-shape, to allow for rear wheel clearance and maxmum lower side compartment depth.

OVERHEAD HOSE BODY: FORWARD DUNNAGE AND REARWARD HOSE BED

The upper level centerline of hose body is to include a forward dunnage area, and a rearward hose bed area.

OPEN-TOP DUNNAGE AREA

A forward hose body transverse divider panel is to be provided, fabricated with perimeter flanges, and bolted in position (so as to be removable) immediately to the rear of the water tank fill stack. Transverse divider panel is to form the forward wall of the main hosebed area, and provide a mounting surface for optionally specified adjustable hose bed divider tracks.

Location of the transverse divider panel is to provide for an "open-top" dunnage area, ahead of the main hose bed, overhead the water tank, rearward of the midship pump module.

Dunnage floor gratings are to be provided, same material and construction as is specified for the hose bed, notched to custom fit around the specified tank fill stack(s).

HOSE BED: ALUMINUM GRATINGS

The apparatus main hose bed area is to be located to the rear of the transverse hose body divider panel, between passenger's and driver's inboard apparatus body sides.

Multiple double-break flange reinforced tank retainer/hose load support beams are to be provided, spanning between and bolted to the inboard apparatus body sides. Beams are to be constructed of body matching material, profile is to be of minimum height to maximize hose bed depth, and the beams are to be positioned no more than twenty (20) inches apart.

Extruded aluminum slatted hose bed floor gratings are to be furnished, running longitudinally the full length of the hosebed. Longitudinal grating slats are to be fastened to underside perpendicular cross-slats which extend the full width of the hose bed cavity. The hose bed floor gratings are to be assembled with bolts (not welded), so as to allow for future modifications and repairs to the grating assembly. Longitudinal gratings are to be single piece full length extrusions, spaced at least 1/2" apart to allow for hose ventilation. Cross-slats are to be positioned to rest on the top surface of the specified overhead tank retainer/ hose load support beams.

STAINLESS STEEL ADJUSTABLE HOSEBED DIVIDER TRACKS

Channel fabricated stainless steel hosebed divider horizontal slide tracks are to be furnished, transverse at the rear of hosebed, designed so as to retain the floor gratings and prevent snagging of hose or couplings during deployment and re-loading operations.

In addition to the rear transverse hosebed divider slide track, two (2) parallel transverse stainless steel horizontal channel tracks shall be furnished, bolted to/removable from the specified forward cross divider. Forward and rear horizontal channel tracks are to be provided with sliding friction clamps and threaded studs with acorn nuts, allowing infinite side-to-side adjustment of hosebed divider location.

HOSEBED DIVIDER, 1/4" PLATE ALUMINUM

One (1) each, full length full depth infinitely adjustable hosebed divider shall be furnished, fabricated of .250" unpainted machine sanded or abraded smooth aluminum with vertical front and bottom reinforcing extrusion. The top rear corner of the divider panel shall have a 3" radius, to prevent damage to tarps and restraints. All horizontal, vertical, and rear radius metal edges are to be DA sanded smooth to prevent personnel injury and hose damage.

HOSE RESTRAINT: BLACK NETTING

The main hosebed shall be equipped with a rear full width black nylon restraint, consisting of strap netting across the rear of hosebed, with quick-release draw-tight clips.

NO RIDE PLACARD

A WARNING label is to be located on the vehicle at the rear step area that is to caution personnel that riding on these areas while the vehicle is in motion is prohibited. Label is to be permanently encased in a chrome full surround bezel.

TAILBOARD, EMBOSSED 3/16" ALUMINUM TREADPLATE

A full body width rear step/tailboard shall be furnished, constructed of .187" polished 4-way aluminum treadplate material, with an NFPA approved (as slip-resistant) "embossed" tread top surface.

Tailboard shall be a single piece fabrication, with perimeter fabricated flanges, side and rear same width as the body rubrails, and outboard rear corners "beveled" 45-degrees. The beveled corner flanges and the rear flange of tailboard shall be double-broke, and have a total of five (5) diamond shape cut-outs, exposing the under flange mounted rear corner marker lights and rear center marker light cluster. Tailboard shall be spaced 1/2" away from the rear face of body, for drainage, bolted in position and easily replaceable in the event of damage. Underside of aluminum treadplate tailboard is to be lined with a dielectric barrier tape, separating the aluminum from the dissimilar metal underbody subframe structure.

Per NFPA: Steps, platforms, or secure ladders shall be provided so that firefighters have access to all working and storage areas of the apparatus. The maximum stepping height from ground to first step shall not exceed 24". Additional steps cannot be more than 18" apart. All steps, platforms, or ladders shall sustain a minimum static load of 500 lbs. without permanent deformation and shall have skid resistant surfaces. Any step shall have a minimum area of 35 sq. in. Platform shall have a minimum depth of 8".

REAR TOW EYES, EXPOSED AT REAR OF BODY

Two (2) rear painted "tow" eyes shall be located at the rear of the apparatus and shall be permanently mounted directly to the chassis frame rails. The inner and outer edges of the tow eyes shall be radiused, eyes to be 3" in diameter.

COMPARTMENTED BODY CONSTRUCTION MATERIALS & FABRICATION:

FABRICATION MATERIALS

The apparatus body compartments shall be fabricated using 14-gauge thickness, type 304 smooth sheet stainless steel, with #4-polished/brushed finish. All structural sheet metal fabrications are to be of 14-gauge material thickness, including, but not limited to: side and rear lower level compartment floors, wheel well outer panels, rear body corners, and hose bed risers. .

Other specified interior compartment shelving, trays, and shelving tracks shall be fabricated of smooth aluminum, of designated thickness, and shall have a machine sanded finish.

The specified 4-way treadplate apparatus body components shall be type 3003 "Brite" aluminum C-102 or equal pattern treadplate, NFPA approved no-slip diamond on step and walk surfaces.

PRECISION MACHINING AND FABRICATION

All individual apparatus body fabricated components are to be: computer designed for repeatable tolerances, precision computer control machined for superior cut edge quality, and computer control machine fabricated for assembled parts accuracy

FASTENERS:

All apparatus body screw type fasteners shall be stainless steel "low profile" button socket head cap screws with stainless steel hex "Ny-Lok" threaded nuts designed to prevent loosening. Size of fasteners, 1/4" minimum, and their spacing must provide for maximum structural integrity and no leakage in flanged areas between fasteners. Any necessary exterior exposed nut fasteners shall be polished stainless steel or chrome plated "acorn" covering fastener threads. **NOTE: Hex head, truss head, Phillips pan head, or other large profile style fasteners shall not be used for assembly of fabricated sheet metal components. Additionally, there are to be NO 3/16" fasteners of any style used for structural applications.**

CONSTRUCTION METHODS:

All individual fabricated body components are to be assembled with removable fasteners for ease of modifications and repairs. Exterior compartment and hose body fabrications must be free of all projections which might injure personnel or fire hose. NOTE: Where "nibbled" or other non-continuous non-smooth cutting methods are used to machine the body material, all edges must be reworked/filed for injury prevention and improved appearance.

The described construction methods are to insure easy disassembly of the apparatus body in the event of damage or need for future modifications. Apparatus designs or construction methods which do not allow for disassembly and removal of major fabricated components are not to be considered "equal" to this construction method.

Specified upper level side compartments shall have fabricated vertical door jambs located above wheelwell enclosure, separating forward/upper level wheelwell/rear compartment areas. Door jambs are to be bolted to sweep-out threshold portion of upper level compartment opening and to the underside of overhead compartment roof fabrication, easily removable so as to allow future modifications to door opening size.

For maximum cubic footage of compartments, the lower portion of the interior forward side compartments shall be recessed into within 4-inches of the chassis frame rail depth, both driver's side and passenger's side of the apparatus body.

Recessed areas to be full width of interior compartment, at least 30" high, occupying entire underbody area beneath the outboard portion of the water tank.

REAR BODY CORNER STYLE:

The rear driver side and passenger side body corners shall be "square" outboard fabrications, with full height integral side door jamb. The rear facing vertical back surface of body corners shall allow for mounting of rear DOT and emergency lighting, handrails, multiple steps, and optionally specified accessories.

FRONT BODY CORNER:

The front body corners shall have full height vertical front surfaces, and integral forward compartment door jambs.

SWEEP OUT COMPARTMENT FLOORS:

Driver's side, passenger's side, and rear compartments shall be equipped with "sweep/wash-out" floors, which are raised at least 1" above the compartment door opening threshold and exterior rub rail. All runningboard/tailboard level side compartment door thresholds shall extend outboard, below the compartment doors, with a minimum 3" flange-down (flush with body sides) and 1" return-in, providing structure for mounting of the specified rub rail material. Door thresholds shall be bolted to and removable from the interior raised compartment floors.

Upper level compartment floors, located above rear wheel well housings, are to be "sweep/wash-out" design, fabricated of body material matching smooth sheet material. Upper level compartment door bottom threshold shall be integral with the rear wheel well outer panel, positioned at least 1" below the interior compartment floor surface, and lined with mirror finish stainless steel for doorway protection.

SQUARE FRONT COMPARTMENT CORNERS

The driver side and passenger side outboard front body corners are to incorporate a fabricated full height 90-degree "square" corner.

CONSTRUCTION FEATURES:

During assembly all areas where metal mates or abuts shall be properly caulked with G.E. or equal silicone body sealant to prevent moisture penetration.

Where compartment wall/bulkhead mounted vertical slotted adjustable shelf track assemblies are specified, the tracks are to be bolted in place and easily removable. NOTE: Weld-on shelving tracks do not meet the intent of this requirement.

Wheelwell trim is to be furnished as specified below, bolted in position and easily replaceable, surrounding driver's side and passenger's side rear body "radius" wheelwell cut-outs.

ALUMINUM TREADPLATE ROOF OVERLAYS

Driver's and passenger's side compartment roof tops shall be lined/plated with designated material, flanged down on front, rear, and full length outboard side. Liners shall extend the full length and the full width of compartment roof tops. Outboard full length flange shall "bend out" at bottom to form drip cap above compartment door tops. Flange mating corners of roof top liners shall have "TIG" welded closures. Where aluminum treadplate liners are specified, they shall be underside coated with a spray on rubberized "barrier" coating, prior to final bolt-on installation.

REAR BODY RAISED UNDERCARRIAGE "UP-SLOPE" INCREASED DEPARTURE ANGLE

The rear underside of the apparatus body, starting at the rearward wall of the rear wheel well housing, is to slope upwards allowing for at least a eighteen (18) degree rear departure angle. The specified cantilevered rear tubular body sub frame, and the interior floor level off the driver and passenger rear side compartments are to be approximately 6-inches higher than the rub rail level of the mid-section body (ahead of the rear wheel housing). A likewise elevation of the bottom of rear side compartment doors is to take place. NOTE: Where the side compartment doors are hinged style, the exterior door handle is to remain at the same level as the forward side compartment door hardware.

For improved appearance underside the rear side compartment floors, an aluminum treadplate rocker panel is to be provided, its forward bottom profile at the same level as the bottom of mid-section body rub rails, and rearward bottom profile inline with the rear rubrail/bumper.

CLASS-V TRAILER HITCH RECEIVER WITH BRAKE CONTROLLER

A Class-V receiver trailer hitch shall be installed at rear of apparatus, centerline below tailboard/bumper. Receiver shall be rated not less than 12,000 lbs. gross trailer weight with a minimum 1200 lb. vertical load capacity. The receiver shall be reinforced, indirectly attached to the chassis frame rails, so as to transfer "pulling" loads to the chassis frame. Hitch shall be provided with loops, on each side, for trailer tongue safety chain.

One (1) heavy duty Class-V hitch, 4" drop style, shall be furnished with safety pin.

A Bergman, or customer approved equivalent, weatherproof 7-way round, pin style, trailer connector (brake/stop/tail connection with trailer brake control) shall be installed beside hitch receiver.

12-VOLT WINCH RECEPTACLE(S)

12-volt winch power receptacle(s) shall be furnished, located at the above specified two (2) winch receiver locations. Winch power receptacles shall be wired to the chassis battery system, using loom encased 1-0 multi stranded copper insulated battery cable, with soldered terminals.

UNDER BODY STAINLESS STEEL SUBFRAME:

An Apparatus Body Sub-Frame is to be furnished, completely independent of the assembled apparatus body and its compartments. Body sub-frame will be bolted to and easily removable from the chassis frame rails and from the compartmented body module. The apparatus sub-frame, including the specified forward yoke assembly with torsion suspension, and rigid rear cantilevered platform, will be constructed of rectangular heavy wall type 304 stainless steel tubing. Sub-frame design will provide a structural "platform" onto which the apparatus body and compartments rest, allowing for any individual fabricated component or subassembly of the apparatus module to be disassembled and removed from the sub-frame.

Top mating surface (body to sub-frame) of underbody and tailboard supports will be fully lined with barrier tape so as to properly isolate any dissimilar metals.

FORWARD SUB-FRAME

A forward sub-frame "yoke" will be furnished, with upper level horizontal full body width transverse cross-members supporting the over-the-frame intra-cab floor, and lower level horizontal members providing under-compartment-floor support of all optionally specified exterior recessed compartments. Sub-frame vertical profile is to allow for maximum interior depth of recessed compartments, and its horizontal profile is to allow for minimum cab floor height above the chassis frame rails. Bolt-through rubber cushion "vibration and torsion isolators" shall be provided, at least six (6) each, three (3) per chassis frame side, securing the body sub-frame yokes to the side web of chassis frame rails. The bolt-through isolators shall allow unlimited twisting-moment of the chassis frame rails, independent of and not constrained by

the apparatus under body sub-frame. The yoke's lower level horizontal under-floor supports shall consist of multiple horizontal tubes with fabricated stainless steel channels, spanning between tubes, allowing for a floor load rating of 1000 pounds per compartment.

REAR SUB-FRAME & TOW EYES

A rear "cantilevered" under body and tailboard sub-frame platform will be furnished, with tubular members welded to vertical 3/4" steel glove plates, to be located back of the rear most chassis suspension brackets. The glove plate frame drops are to be bolted to the side web of rear chassis frame rails, and shall include integral bottom 3" diameter machined "closed" tow eyes. A heavy tubular cross member shall span between the tow plates, bolted and removable, so as to allow vertical installation and removal of the sub-frame with body intact.

SUB-FRAME MOUNTING PROCEDURE

All apparatus body yoke and platform sub-frame components will be attached to the chassis frame using hardened steel locking thread nut & bolt fasteners, with bolt holes precision machined through chassis frame side webs. Body sub-frame horizontal supports will be positioned parallel/level with chassis frame rails, lowered so as to provide approximately 20" (with vehicle fully loaded) from the ground to top of apparatus body rub rails, runningboards, and rear tailboard/bumper.

Please refer to the provided apparatus drawing for further description and depiction of the sub-frame.

NOTE: Apparatus body sub-frames which are fastened to the chassis frame rails with U-bolts, sandwich clamps, or other temporary fastening methods, AND/OR body sub-frames that are permanently welded to the body fabrications or extrusions, AND/OR sub-frames that do not provide under-compartment-floor support are not considered "equal" to these above construction methods.

FILTERED COMPARTMENT VENTING

A minimum of six (6) each, waterproof filtered compartment vents are to be provided, consisting of: multiple vented pass-through openings to the body under side. Vented openings are to be covered with 3M water resistant mesh filter media and an interior compartment metal grille. Grille is to be attached to the interior compartment wall with reusable stainless steel screw fasteners with nylon threaded inserts, allowing for removal and cleaning of the filter media from inside of each vented compartment. Vent opening, mesh filter media, and removable grille design is to allow for dust and moisture free ventilation of the compartment interiors, without reduction of the interior compartment depth.

3D ENGINEERED PUMPER APPARATUS BODY & ACCESSORIES

The specified fire apparatus pumper body design is to be "fully engineered", with ALL body structural fabrications and body accessory fabrications computer three-dimension modeled and on-screen assembled. Each individual part profile is to be traceable to a precision engineered digital drawing.

Body and accessory fabrications which are to meet the above design criteria, include: four (4) body corners, body front and rear panels, wheel well housings and liners, compartment door jambs and bulkheads, side compartment floors and roofs, compartment walls and wire covers, roll-up door bundle pendants, tailboard and runningboards/steps, non-painted metal overlays and polished stainless trim, and hose bed risers and dividers. Where optionally specified, the following body accessories are also to meet the above engineered parts criteria: shelving and adjustable tracks, trays and tool boards,

In addition to the part profile and fabrication details, the precision engineering is to include fastener holes for assembly of all components, compartment vent and filtration holes, handrail bracket mount holes, wiring grommet holes, door hardware mounting holes, body step mount holes, and electrical fixture recessing and mount holes.

APPARATUS BODY SIDE COMPARTMENT CONFIGURATION:

A precision machined and fabricated fire apparatus compartmented body is to be furnished, designed to be located immediately rearward of the specified chassis cab and/or crew cab, totally separate of same. The compartmented body is to be mounted to, supported by, and removable from the specified under body structural sub-frame.

The body configuration is to include fully enclosed and weather sealed compartmentation on the driver side and the passenger's side of vehicle. In order to provide for maximum depth compartmentation, the wheel well housings are to completely enclose the rear axle suspension components, allowing for the lower portions of the side compartments to extend inboard to the chassis frame depth. Additionally, the apparatus body overall side-to-side width (inboard of body rub rails and fender moldings) is to be 100".

Passenger's side compartments are to be provided: one (1) each full-height ahead of, one (1) each upper level above and one (1) each full-height behind rear wheel well housing.

Rear of apparatus body shall accommodate the specified fire pump system, located between the back walls of the rear side compartments.

Driver's side compartments are to be provided: one (1) each full-height ahead of, one (1) each upper level above and one (1) each full-height behind rear wheel well housing.

The hose bed area is to be located between upper level body side/compartment back walls.

BOBY WIDTH AND COMPARTMENT WIDTH ARE SUPJECT TO CHANGE WITH THE SELECTION OF THE SUPER SINGLE TIRE OPTION

COMPARTMENTATION, THREE (3) EACH: DRIVER SIDE

D1: OEM to provide dimensions

D2: OEM to provide dimensions COMPARTMENT TO BE 2/3rd DEPTH TO ALLOW EXTRA STORAGE

D3: OEM to provide dimensions

COMPARTMENTATION, THREE (3) EACH: PASSENGER SIDE

P1: OEM to provide dimensions

P2: OEM to provide dimensions

P3: OEM to provide dimensions

COMPARTMENT DOORS AND DOOR ACCESSORIES:

The following specified roll-up style compartment door tracks/extrusions to be "flush" with exterior body panels/door jambs. NOTE: Specified roll-up compartment doors shall be manufactured in the United States of America.

Specified compartment door jambs shall be fabricated with inboard flanges which are machined for screw type fasteners and mounting of specified roll-up compartment door aluminum side track extrusions.

All side compartment doors shall be ROM Robinson roll-up shutter style, complete with: Extruded aluminum shutter slats which are anodized satin finish, anodized tubular bar style bottom rail latch, anodized extruded aluminum vertical side tracks with removable neoprene rubber weatherstripping, anodized painted top door opening extrusions with removable neoprene rubber weatherstripping, and spring loaded "front roll" door lift/roll-up mechanism.

Each individual roll-up extruded aluminum door shall be of maximum size for the available door opening. Front and rear extruded aluminum door tracks shall be furnished, bolted to vertical door jambs and interior compartment bulkheads so as to be easily removable for repairs or modifications. All roll-up style compartment doors shall be installed and adjusted during body construction. NOTE: Roll-up door tracks which are riveted or welded in position are not acceptable.

The following specified door opening sizes may be reduced by no more than 3" total width (1-1/2" per side) and 4" total height. Decrease in compartment opening sizes is caused by profile of side track extrusions with weatherstripping and bottom door slat which remains in door opening.

ROM VERTICAL STRIP INTERIOR DOORWAY COMPARTMENT LIGHTING

One (1) per compartment ROM brand 12-volt multiple LED element, interior compartment vertical "strip" tubular lights, shall be furnished. Lights to be inboard the specified door tacks or jambs, activated by "opening" of the respective compartment door, using a magnetic bar latch switch where roll-up doors are provided (mechanical plunger switch where hinged doors are provided). Lighting shall have polycarbonate lens to resist breakage from impact and damage from light element heat.

REAR BODY FASCIA

Exterior rear face of body (fascia) shall be a flat vertical surface extending from side-to-side, between and flush with rear compartment corners.

REAR BODY FACE CONSTRUCTION MATERIAL

Exterior rear face of body, including: passenger's side rear door jamb, driver's side rear door jamb, and rear top header (below hosebed) shall be fabricated of type 304 smooth plate stainless steel, to allow for application of reflective graphics.

VERTICALLY ADJUSTABLE HORIZONTAL "DEEP" SHELF(VES), PAN FLANGED

Three (3) perimeter flanged full compartment front-to-rear width x compartment depth (19"+) fabricated aluminum shelf/shelves to be furnished, clamp-bolted to and removable from adjustable slotted wall tracks.

Each shelf is to be a single piece fabrication, 2-inch perimeter flanged-up, forming a "pan, and providing for a recessed floor surface.

Each compartment adjustable shelf is to rest on, and be bolted to angular metal brackets which are compatible with the specified compartment wall mounted slotted tracks. Each shelf is to be provided with four (4) female threaded cadmium plated spring-loaded "cleats", designed to slide vertically in the specified wall mounted shelf tracks.

Each shelf is to be constructed of .190" smooth unpainted natural finish aluminum, and is to have a load capacity of no less than 500 lbs.

ADJUSTABLE SHELVING LOCATION(S):

Deep Compartment Shelf/Shelves are to be located in the upper portion of compartment(s):

D-1:One (1) each

D-2:One (1) each

D-3:One (1) each

P-1:

P-2:

P-3:

ADJUSTABLE SHELF TRACKS, LOW PROFILE

Six (6) sets of Laser cut vertically slotted bolt-on "low profile"shelf tracks are to be furnished, mounted two (2) on forward and two (2) on rearward interior side walls of the designated apparatus body side compartments. Tracks are to be designed to accommodate spring-loaded threaded cleats allowing for infinite vertical adjustment of the optionally specified horizontal compartment shelves. NOTE: Cleats are to be provided, only with the optionally specified shelves, four (4) each per shelf.

Shelf tracks are to be fabricated of .125" smooth natural finish aluminum, and their design must allow for the shelving width to match the compartment clear opening width.

BLACK SECTIONAL VINYL FLOOR TILES

Black vinyl Turtle Tile or equal sectional floor tiles shall be provided, floor level of driver's side, passenger's side, and rear compartments.

EXTRUDED ALUMINUM RUBRAIL

Bottom edge of side compartments, ahead of and behind rear wheel cut-out, to be lined with brite aluminum extruded rubrail material. Rubrails shall be located immediately below the sweep-out bottom door threshold, extending from front to rear of body, equipped with eight(8) machine tapered replaceable poly end plates. Rubrails are to be channel shaped with flanges outboard, be spaced away from body with non-metallic shims, to allow for wash-out and adsorption of minor impacts without damage to body flange.

Rubrails shall be bolted in position, easily replaceable.

BODY FENDER MOLDINGS

Polished extruded aluminum 25" radius wheelwell moldings shall be furnished, bolted in position surrounding driver's side and passenger's side rear body "radius" wheelwell cut-outs. Wheel well molding fasteners shall be concealed beneath the extrusion. NOTE: The profile of these moldings will allow the apparatus body to remain within the legal overall width as required by Federal D.O.T. vehicle standards, furthermore; wheel well moldings will not extend beyond the purchaser specified rubrails.

BASE MOUNT HARD SUCTION HOSE TROUGHS

Two (2), each hard suction hose trough(s)/tray(s) shall be furnished, located as designated below, equipped with forward coupling clip style stop/retainer and nylon rear hose retainer. Troughs shall be "base-mount" style, fabricated U-shape for particular specified size of hard suction hose. Where hose coupling may contact body, a scuff protection overlay shall be furnished.

Troughs shall be constructed of polished 4-way treadplate aluminum.

TUBULAR HANDRAILS, VERTICAL REAR INBOARD CORNERS

Apparatus body tubular railings are to be furnished, consisting of: 1-1/4" o.d. extruded aluminum tubing, chrome plated double bolt type 3" stand-off end type and center rail brackets, and neoprene rubber surface mounting gaskets furnished between rail bracket and painted body surface.

Tubular railings at step areas are to be provided with an aggressive machined "knurled" non-slip exterior surface. Two (2) tubular railings are to be located: 1-passenger's side and 1-driver's side at vertical rear inboard compartment corners.

Two (2) tubular railings are to be located: 1-passenger's side and 1-driver's side at vertical rear beavertails or inboard or outboard compartment corners, as is appropriate for rear body corner design. Handrails are to begin approximately 24" above tailboard, extending to the full height of inboard rear body corners/beavertails.

HORIZONTAL REAR HANDRAIL, BELOW HOSE BED

Matching material tubular railing is to be provided, horizontally on rear body vertical panel below the hosebed gratings. Railing is to be as wide as is possible, without causing interference with optionally specified rear inlets/outlets or step assemblies

WALL TRACKS FOR SCBA BRACKETS, DRIVER SIDES

Two (2), horizontal wall tracks shall be furnished, installed on back wall of upper level driver side compartments. Tracks shall be spaced, for mounting of walk-away style SCBA brackets, and shall include 4 each threaded studs.

REAR BODY CORNER FOLDING STEP(S)

Three (3) each chrome plated cast metal folding drop-down body step(s) shall be furnished, bolted to vertical surface of rear face of body, evenly spaced above the tailboard level, in a customer designated location. Steps to be NFPA approved size, non-slip step surface, and capacity.

NON-SLIP STIRRUP STEPS, TWO (2) EACH

Driver side and passenger side under runningboard "stirrup step" with non-slip surface shall be furnished 8" below rubrail, located appropriately beneath the top-mount walkway entrance steps. Step depth to be at least 5", with open back/toe area.

Exterior exposed top surface step area shall be pattern-cut/puncture-fabricated for non-slip foot grip surface.

SUCTION HOSE OR SUPPLY HOSE:

Per NFPA 1901 current edition, it is acknowledged the End user shall provide a minimum of 20-ft. of suction hose or 15-ft. of supply hose and install it on this pumper prior to placing in service.

NFPA REQUIRED FIRE HOSE AND NOZZLES - END USER RESPONSIBILITY

NOTE In order to meet the current requirements of NFPA 1901 it is acknowledged that the end user will furnish and appropriately mount any and all Fire Hose and Nozzles not listed herein but as required by the most recent standards prior to placing this vehicle in service.

PIKE POLES - END USER RESPONSIBILITY

NOTE In order to meet the current requirements of NFPA 1901 it is acknowledged that the end user will furnish, the minimum number of pike poles specified prior to putting this vehicle in service.

AXES - END USER RESPONSIBILITY

NOTE In order to meet the current requirements of NFPA 1901 it is acknowledged that the end user will furnish, the minimum axes specified prior to putting this vehicle in service.

FIRE EXTINGUISHERS - END USER RESPONSIBILITY

NOTE In order to meet the current requirements of NFPA 1901 it is acknowledged that the end user will furnish, the minimum fire extinguishers specified prior to putting this vehicle in service.

WRENCH HOLDERS - END USER RESPONSIBILITY

NOTE In order to meet the current requirements of NFPA 1901 it is acknowledged that the end user will furnish, the minimum wrench holders specified prior to putting this vehicle in service.

WHEEL CHOCKS , WITH UNDERBODY BRACKETS

One pair (2 each) Ziamatic AC-32 single piece aluminum wheelchocks to be furnished, complete with QCH-32H horizontal underbody slide-out mounting brackets. Chock underbody brackets to be mounted driver side, ahead of and behind the rear wheels (or as customer designated), beneath compartment floors.

NOTE: The customer must provide a "waiver" to furnish the above specified wheel chocks, which do not meet the tire diameter requirements as specified by NFPA.

HAND LANTERN(S) - END USER INSTALLED

NOTE In order to meet the current requirements of NFPA 1901 it is acknowledged that the end user will furnish prior to placing in service, a minimum of two (2) appropriate portable hand lights, mounted in brackets fastened to the apparatus.

NFPA REQUIRED MISCELLANEOUS - END USER RESPONSIBILITY

NOTE In order to meet the current requirements of NFPA 1901 it is acknowledged that the end user will furnish and appropriately mount any and all equipment not listed herein but as required by the most recent standards prior to placing this vehicle in service.

ELECTRICAL - 12 VOLT

NFPA RELATED NON-EMERGENCY 12-VOLT ELECTRICAL STANDARDS:

ELECTRICAL WIRING INSTALLATION - 12 VDC

All electrical circuit wiring installed by the apparatus body builder is to be stranded copper alloy conductors of a gauge rated to carry 125% of the maximum current for which the current is protected. Wiring is to be colored and/or printed with circuit function code over each conductor's entire length.

Original non-protected chassis wiring, extending to rear, including: left turn circuit, right turn circuit, brake circuit, and back-up light circuit is to be re-routed to the interior chassis cab. New replacement color coded legend imprinted SXL insulated multi-stranded copper chassis wiring is to extend from chassis cab to rear body electrical chassis functions. Wiring is to be enclosed inside specified apparatus body in heat resistant vinyl loom.

AMBER TURN LIGHT ACTIVATION

Dedicated wiring shall be provided from chassis turn signal control, to the rear of the apparatus, for signaling of the specified apparatus body left and right side rear amber turn lights. Rear amber turn lights are not to be activated by brake lights.

ELECTRICAL WIRING INSTALLATION PERFORMANCE - 12 VDC

All wires are to be of sufficient size so that voltage drop in any electrical device shall not exceed 15%.

BATTERY CABLE INSTALLATION STANDARDS

Chassis battery cables are to be routed from batteries' common positive to engine starter, return from engine starter to battery switch, and from battery switch to the chassis power distribution terminal post and to post located on a frame rail, and then to the apparatus body power distribution center (PDC). All battery cables are to be appropriately sized welding cable, heavily insulated super fine multi-stranded copper enclosed within high temperature vinyl loom and equipped with plated copper soldered terminals/lugs. Edge protector or rubber grommet is to be furnished where ever battery cables pass through sheet metal panels.

AUDIBLE DEVICE INSTALLATION STANDARDS

When furnished, air horns, electric siren, electronic siren speakers, and other audible emergency equipment are to be mounted as low and as far forward on the apparatus as practical. Audible warning equipment is not to be mounted on the roof of the chassis cab.

NON-REMOVABLE IGNITION DEVICE

The chassis ignition actuation is to be by a rotary/toggle style switch, or by a key switch with key permanently chained to the dashboard.

WIRING HARNESES

All apparatus body wiring for specified lights and electrical equipment is to be suitably protected inside heat resistant vinyl, forming multiple harnesses. Multiple harnesses are to run from chassis cab and apparatus body to a PDC (power distribution center). Harnesses are to consist of individual legend imprinted multi-stranded copper color coded SAE-J 1128 compliant automotive wires inside vinyl loom. Spare wires are to run throughout the apparatus compartmented body so as to allow for future installations of electrical accessories, while using original harnesses. All wiring is to be identified, "imprinted" with number and/or function. Auto-reset circuit breakers are to be furnished, of various amperage capacity, sized for intended load.

All 12-volt switches, relays, terminals, connectors, and wiring are to have a direct current rating of 125% of maximum current for which the current is protected. All wiring terminals are to be machine crimped, pull-tested during assembly.

APPARATUS BODY POWER DISTRIBUTION CENTER

An enclosed 12 volt electrical cavity is to be provided in the driver's side lower front compartment. This cavity is to be recessed inboard a front compartment removable bulkhead, of adequate size, to house all of the body wiring junction points, terminal strips, relays, etc. The design of this cavity must not decrease the storage capacity area of the compartment in which it is located. A flush mounted removable panel is to be provided for access to this cavity, panel to be equipped with a minimum of four (4) flush mounded latches.

The power distribution center is to be located interior of 12 volt electrical cavity, and is to contain engineered electrical components and waterproof pin/socket bulkhead connectors. Multiple circuit breaker sockets are to be furnished for future use.

BATTERY CABLE UPGRADE

A 600 amp fuse protected 2-0 multi-stranded copper insulated battery cable is to be run inside protective loom, extending from specified battery disconnect to a chassis frame mounted threaded copper stud, providing power to high amperage items such as: primer motor, electrical discharge valves, reel rewind motors, generator starter motor, etc.

"Vehicle Specific" wiring information is to be provided for this particular apparatus "as built" upon completed delivery of the same. Information to be in spreadsheet format, describing PDC connections and functions.

APPARATUS LIGHTING INSTALLATION STANDARDS:

All specified 12-volt to be in accordance with D.O.T. regulations at time of purchase.

WALKWAY, STANDING PLATFORM, AND WORK AREA LIGHTING

Specified standing, stepping, and walking surface lighting shall be located to minimize accidental breakage.

LIGHTING INSTALLATION REQUIREMENTS

All specified light fixtures to be located/fitted prior to and re-installed after finish painting. Where fixture wiring passes through metal body panel, the pass-thru hole to be equipped with a rubber grommet. All specified light fixtures shall be installed, using stainless steel screws with non-metallic "replaceable" threaded inserts, to allow removal of light fixture, from exterior of body. Where light fixtures are to be installed on a painted panel, all light fixture mounting holes, grommet holes, and fastener holes shall be machined/cut-out prior to prime and finish painting, so that all metal edge surfaces receive the same protective coating. Where holes are cut or drilled, after finish painting, same holes shall receive paint finishes prior to insertion of fasteners and threaded inserts.

FMVSS LIGHTING CONFIGURATION

The following specified rear body tail/stop, turn and back up lights to be positioned: Red (tail/stop) TOP, Amber (turn) MIDDLE, and Clear (back up) BOTTOM, driver's and passenger's side rear of body.

LED REAR STEP LIGHTS

Two (2)each, 12-volt Grote model 60571 LED courtesy step lights are to be furnished, located to illuminate step surfaces at the rear of the body. Light fixture to have polished stainless bezel and shielded clear polycarbonate lens. Lights to be activated by parking brake set.

REAR AND MID-BODY LED MARKER LIGHTING

REAR MARKER

Five (5), rectangular surface mount multiple element LED marker lights with reflective red lenses are to be furnished, located: two (2) recessed into specified rear tailboard corners and three (3) recessed behind center rear tailboard flange diamond shape cut outs. Marker lights to be activated by headlamp switch.

The three (3) marker lights located at the rear to be:

As close as is practical to the vertical Centerline.

Centers spaced not less than six (6) inches or more than twelve (12) inches apart.

All at the same height.

The two (2) outside marker lights located at the rear shall be installed:

To indicate the overall width of the vehicle.

At the same height.
To be visible from the rear and the side.

MID-TURN/MARKERS

Two (2), surface mount mid-ship Weldon model 9186-8580-29 LED dual element, combination marker & turn lights, are to be furnished, located: one (1) driver's side mid-ship vehicle and one (1) passenger's side mid-ship vehicle. Light fixtures are to have Amber lens. Marker Light is to be steady on with headlights, Turn Lights are to have flashing element, activated by vehicle turn signals.

STOP/TAIL LIGHTS

Two (2), Whelen model 60BTDD, Red element 5" x 8" rectangular surface mount LED combination stop/tail lights to be furnished, mounted each side at rear of body. Lights to be wired for activation by service brake and headlamp switch.

REAR TURN SIGNALS

Two (2), Whelen model 60A00TAD, Amber element 5" x 8" rectangular surface mount LED turn signal lights with populated arrow shape and multiple flash patterns to be furnished, mounted one each side at rear of body. Lights to be wired for activation by left or right turn signal (not by brake lights).

BACK-UP LIGHTS

Two (2), Whelen 60C00VCD, Clear element rectangular surface mount LED back up lights to be furnished, mounted one each side at rear of body. Lights to be wired for activation by reverse gear of truck transmission.

Above specified lights to include appropriate "chrome plated" 6EFLANGE(s) and be bolted in position, evenly spaced, driver's side and passenger's side rear body corners.

BACK-UP ALARM

One (1), 12-volt Ecco model 520 electronic back-up alarm to be furnished, mounted at rear below body, activated by reverse gear of truck transmission.

DO NOT MOVE APPARATUS " HAZARD" INDICATOR LIGHT

An LED style flashing indicator light shall be furnished, installed on cab dashboard, visible to driver, and as per current NFPA requirements, the light shall be illuminated automatically, as listed below:

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

DEVICES WHICH ACTIVATE THE "DO NOT MOVE APPARATUS" INDICATORS

Opened chassis cab doors, crew cab doors, and/or open apparatus body exterior compartment doors, are to activate/illuminate the above specified "DO NOT MOVE APPARATUS" hazard warning indicator light.

COMPARTMENT INTERIOR LIGHTING

See APPARATUS BODY segment of specifications, for description, and location of provided body compartments interior lighting.

ENGINE COMPARTMENT LIGHT, LED

One (1), Truck-Lite, Weldon, or equal surface mount 12-volt LED engine compartment interior light to be furnished, located engine compartment underside engine hood. Light to be activated by an individual light fixture mounted switch.

PERIMETER UNDERCAB LIGHTS

Two (2) each, 4" LED grommet mount under chassis cab 12-volt ground lights to be furnished, located one (1) driver's side and one (1) passenger's side, beneath cab doors. Lenses to be 4" diameter, Clear. Lights to be completely sealed for weather resistance. Lights to be activated by setting of the parking brake.

PERIMETER UNDERBODY LIGHTS, FOUR (4) EACH

Four (4) each, 4" LED grommet mount under body 12-volt ground lights to be furnished, located: two (2) each driver's side ahead of and behind rear wheels and two (2) each passenger's side ahead of and behind rear wheels. Lights to be completely sealed for weather resistance, lenses 4" diameter. Lights to be wired for activation by setting of the parking brake.

ELECTRONIC SIREN

One (1), Whelen model 295SLSA1, "Hands Free" electronic siren amplifier w/park-kill feature, selectable 100 or 200 watt output to be furnished. Electronic siren to have a "piercer" tone. A permanently wired microphone to be furnished with coil cord and mounting clip. Siren amplifier to be wired to specified electronic speaker(s).

Siren control head shall be located Surface mounted to center console.

100 WATT SPEAKER

One (1), Whelen model SA315P, 100-watt rectangular concealed speaker to be furnished, located recessed behind front bumper. Vertical surface of front bumper to be "cut-out", back side (between bumper and speaker) furnished with polished stainless steel speaker grille.

CAB ROOF LIGHTBAR: WHELEN FREEDOM, 55" RED & CLEAR LED ELEMENTS

One (1ea), Whelen "Freedom" model FN55VLED, 55" long Linear-LED light bar shall be furnished and installed, permanently mounted to forward roof top of chassis cab.

Light bar shall be provided with:

Six (6) red LED's, located: 2-forward facing, 2-front corners, 2-rear corners.

Two (2) clear LED's, located: 2-forward facing.

Light bar shall be switched in the chassis cab, identified as: "CAB ROOF LIGHTBAR"

All lenses are to be clear, with clear and red light elements, as specified.

NOTE: Activation of vehicle's Parking Brake shall disengage any forward facing clear lights.

GRILLE WARNING LIGHTS - LED

Two (2), Whelen 500 series, TIR Super LED, 5" x 1-5/8" rectangular surface mount LED lighthoods and two (2) 5EFLANGE chrome plated surrounds to be furnished, surface mounted located on front grille. Light lenses to be 5" wide x 1-5/8" high, driver's Red, passenger's side Red. Lights to be activated by a separate illuminated rocker switch, identified by function.

FRONT LOWER LEVEL LED WARNING LIGHTS

Two (2), Whelen model 500 series TIR6 Super LED rectangular lighthoods and two (2) 5TSMAC chrome plated surrounds to be furnished, surface mounted located driver and passenger front bumper sides or hood/cab sides. Light lenses to be driver's Red, passenger's side Red. Lights to be activated by a separate illuminated rocker switch, identified by function.

B & D LOWER ZONE MID-SECTION SIDE, LED WARNING LIGHTS

Two (2), Whelen model 60R02FRR, Red flashing LED lights with Red lens and chrome trim flanges are to be furnished,, one (1) on each side of the apparatus in the front or the rear portion of the rear wheel wells. Lights are to meet the NFPA Zone B & D lower level lighting requirement.

REAR OF BODY LOWER LEVEL LED WARNING LIGHTS

Two (2), Whelen model 60R02FRR, 6" x 4" rectangular surface mounted LED light heads and two (2) 6EFLANGE chrome plated surrounds to be furnished, located one (1) driver's side lower rear body corner, one (1) passenger's side lower rear body corner. Light lenses to be driver's side Red, passenger's side Red. Lights to be activated by specified switch, identified by function.

REAR UPPER LEVEL LED "STACKED" LIGHTS

Six (6), Whelen 500 series TIR6 Super LED rectangular surface mounted light heads to be furnished and mounted two (2) rear upper sides (1-each side) two (2) driver's side rear and two (2) passenger's side rear "stacked" one above. Lights to be activated by specified switch, identified by function. Light lenses to be driver's side Red, passenger's side Red.

MACHINE "SWIRLED" FINISH ON SHELVES

The optionally specified three (3) each Shelves are to be abrasive machined, fully on topside and underside, with a "swirl" pattern, providing a scuff resistant marbled natural aluminum finish. Swirl machining of the metal surface is to be performed after profile cutting of shelf and prior to its fabrication.

CHASSIS FRAME AND DRIVE TRAIN FINISH, TO REMAIN ORIGINAL OEM FINISH

The chassis frame assembly is to remain the color and paint quality as received from the chassis manufacturer (OEM). The frame and drive train components are not be repainted.

Components that are considered part of the "frame assembly" are frame rails, cross members, axles, suspension, steering gear and the fuel tank.

GRAPHIC STRIPING

The apparatus body and chassis cab shall be "striped" on both sides, and across front, with multi colored and multi width striping designed and manufactured by a graphics supplier. Striping shall be installed prior to completed delivery of the apparatus.

REFLECTIVE MEDIA (STRIPING), CAB INTERIOR DOORS

A RUBY RED ScotchLite or equivalent reflective stripe is to be affixed to the interior of each chassis cab door. The stripes are each to be a minimum of 96 sq. in. so as to meet the NFPA 1901 requirement.

PREPARATIONS FOR CHEVRON GRAPHICS

Due to the dissimilar metal content encapsulated in the Chevron Graphics Materials, the portions of the apparatus body to be Chevron overlaid; are first to be prime painted and finish painted, thus providing a barrier coat.

Following specified Chevrons are to be applied to the rear apparatus body fabrications only (rear body corners and rear facing panel), not to the exterior surface of any specified rear compartment door(s).

CHEVRON STRIPING, REAR APPARATUS, RUBY RED & LEMON YELLOW

Up to 48 square feet of 6" multiple diagonal 3M Scotchlite or an equivalent brand reflective stripes are to be provided, full width at rear of apparatus body. Stripes are to form "Chevrons", using alternating Ruby Red/Lemon Yellow reflective stripes, only interrupted by the rear apparatus lighting, handrails, steps, and other bolt-on accessories. Chevron patterned material is to be applied on to the flat metal "painted" surface, prior to the final installation of the specified bolt-on (removable) fixtures and accessories. Stripes shall be oriented at 45-degree angle, sloping downward and away from centerline of vehicle.

LINE VOLTAGE SHOREPOWER ACCESSORIES

120-VOLT SHORELINE "SUPER" AUTO-EJECT FOR SHORE POWERED DEVICES

One (1) each, 15-Amp Kussmaul model 091-55-15-120 "Super Auto-Eject" automatic shoreline disconnect is to be furnished with; recessed 3-wire straight blade male receptacle, one (1) eject compatible 3-wire female receptacle plug (shipped loose for attachment to customer's provided power cord), and a colored spring loaded weatherproof Auto-Eject cover plate. The auto shoreline disconnect device is to be held in position with four (4) cover plate screws. The Super Auto-Eject is to be wired to the vehicle's 12-volt engine starter or momentary starter switch; such that when the engine is "cranked" the device ejects the line voltage powered cord receptacle.

Back side of auto shoreline disconnect device is to be completely sealed in a non-corrosive waterproof enclosure, with device's external wiring equipped with water-tight connectors. All wiring, extending to the specified shoreplug powered devices, is to be insulated weatherproof jacketed and properly protected to prevent damage.

The specified mating 3-wire female receptacle plug is to be a Kussmaul product, so as to be compatible with eject device.

SHOREPOWER RECEPTACLE LOCATION

The above specified line voltage shorepower receptacle is to be located, beneath the driver's front cab door, on a metal riser plate, side facing.

ON-BOARD BATTERY CHARGER - 35 AMP

A Powermax 35-AMP output/120-volt input fully automatic single 12-volt battery system charger shall be furnished, installed inside the chassis cab. System to be protected against reverse polarity, and 2-way radio interference. Charger to be powered by the specified 120-volt shoreplug receptacle.