Toyne Inc.

== '16 PRV Pumper - 0.000 ==

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 citizen(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.

CORPORATE CONTACT INFORMATION

The purchaser shall be provided with the following information to allow them to contact the President/CEO of the manufacturing company (not dealer) when deemed necessary:

- Name of Company President.
- Office address.
- Office telephone number.
- Email address.
- Home address.
- Home telephone number.
- 24/7 Cellular telephone number.

If the manufacturing company is a subsidiary of, division of, or owned by a different Company, the above information shall also be provided on the 'Parent' Company.

There will be no exception to this requirement.

TOP OF THE LINE FIRE APPARATUS

If the manufacturer or bidder for the apparatus manufacturer represents two or more different lines of apparatus and/or operates two or more manufacturing plants, it should be clearly stated in the bid proposal.

In addition to this requirement, the bidder shall give a detailed explanation of why the particular line, brand, model or manufacturing facility will be used.

Manufacturer’s or bidder’s with multiple lines (two or more) or multiple manufacturing facilities (two or more) shall be required to submit bid proposals on only the top of the line brand/model or from the top of the line facility.

It is the intention of the purchaser to purchase a top of the line, first class, #1 quality fire apparatus. Any bidder that submits a bid on a "lower end" line, brand, model, or from a "lower end" manufacturing facility will be immediately rejected.

The purchaser is not interested in purchasing a manufacturer's or bidders "lower end" apparatus. Because of this, any bids submitted that do not comply with the above requirements will be immediately rejected.

CERTIFICATION OF NFPA 1901-2016 COMPLIANCE

As per NFPA 1901, the Purchaser shall assume the responsibility of determining, prior to the purchase of the

apparatus, whom will be responsible for ensuring that all aspects of NFPA 1901 are met. The manufacturer shall be responsible for providing or performing only the items requested by the purchaser in the documents provided to the manufacturer by the purchaser.

Written certification shall be provided by the manufacturer stating that the delivered apparatus complies with the NFPA 1901 Standard. If the purchaser has elected to provide, perform, outsource and/or contract with a third party or waive any item required by NFPA 1901, the manufacturer shall provide, upon delivery, a "Statement of Exceptions" per Chapter 4 of NFPA 1901 4.21.

The "Statement of Exceptions" shall include:

- A separate specification of the section of the NFPA Standard for which the apparatus is lacking compliance.
- A description of the particular aspect of the apparatus that is not compliant therewith or required equipment that is missing.
- A description of the further changes or modifications to the delivered apparatus which must be completed to achieve full compliance.
- An identification of the entity whom will be responsible for making the necessary post-delivery changes or modifications or for suppling and installing any missing required equipment to the apparatus to achieve full compliance to the standard.

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

The purchaser shall not place the apparatus into active emergency service until fully compliant with NFPA 1901.

NFPA REQUIRED EQUIPMENT

The end user of this apparatus shall provide all other equipment and accessories that are required by NFPA 1901 but not specifically listed in these specifications.

MAXIMUM TOP SPEED

The maximum top speed of this apparatus shall be determined using the following NFPA 1901 Chapter 4 criteria:

- Apparatus with 1250 gallon combined water tank capacity shall not exceed 60 MPH.
- Apparatus with GVWR of over 50,000 lbs. shall not exceed 60 MPH.
- Apparatus weighing over 26,000 lbs. shall not exceed 68 MPH.

BUMPER EXTENSION APRON- CHASSIS PROVIDED

An aluminum treadbrite apron/gravelshield shall be provided in the area between the extended bumper and the chassis cab. This shall be provided by the chassis manufacturer.

HALE MODEL Q-MAX 2,000 GPM SINGLE STAGE PUMP

The fire pump shall be a Hale Fire Pump Company Q-MAX that complies with all applicable requirements of the latest edition of the "Standard for Automotive Fire Apparatus" published by the National Fire Protection Association and

printed in Pamphlet 1901.

PUMP WARRANTY

The pump shall be covered by the Hale Pro-Tech 5-year pump warranty against workmanship and materials. Both parts and labor shall be covered for the first 2 years and years 3-5 shall have parts only coverage.

UNDERWRITER'S LABORATORY CERTIFICATION

The completed apparatus shall be tested and approved by the independent testing company Underwriter's Laboratories, Inc. The manufacturer of the apparatus shall be responsible for all costs involved in this test. The certification of inspection and approval shall be presented to the Fire Chief of the Department upon delivery of the completed apparatus.

PUMP PERFORMANCE - 2,000 U.S. GPM.

The pump shall be a single stage centrifugal with a class "A" rated capacity of 2,000 United States gallons per minute. The pump shall deliver the percentage of rated discharge pressures as indicated below:

- 100 percent of rated capacity at 150 pounds net pressure.
- 70 percent of rated capacity at 200 pounds net pressure.
- 50 percent of rated capacity at 250 pounds net pressure.
- 100 percent of rated capacity at 165 pounds net pressure.

PUMP CONSTRUCTION

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

The pump shall be driven by a drive line from the truck transmission. The pump shall be free from objectionable pulsation and vibration under all normal operating conditions. The engine shall provide sufficient horsepower and revolutions per minute to allow the pump to meet or exceed its rated performance.

The entire pump including both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 psi. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by NFPA 1901.

The pump body and related parts shall be of fine grain alloy cast iron with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable.

The pump body shall be horizontally split, on a single plane, in two (2) sections, for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump on the chassis.

The pump shaft shall be rigidly supported by three (3) bearings for minimum deflection. The bearings shall be heavy-duty, deep groove style bearings in the gearbox and they shall be splash lubricated.

The pump impeller shall be of hard, fine grain bronze with a mixed flow design; accurately machined, hand ground, and individually balanced. The vanes of the impeller intake eyes shall be hand ground and polished to a sharp edge, and shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

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

GEAR BOX

The gear box shall be completely manufactured and tested at the pump manufacturer's factory.

The pump gearbox shall be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine in both road and pump operating conditions. The gearbox shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts shall be of heat-treated chrome nickel steel and shall be a minimum of 2.75 inches in diameter, on both the input and the output drives shafts. The gearbox shall withstand the full torque of the engine in both road and pump operating conditions.

All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and the gear teeth shall be crown shaven, and hardened for smooth, quiet running, and a higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust.

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

NFPA 2016 INTEROCK MOULE

An interlock module shall be provided on the pump shift to comply with NFPA shift safety requirements.

GEARCASE COOLING LINE

A cooling line shall be provided in the pump gear case. A line shall be routed from the discharge side of the pump to the gear case, through the gear case then back into the intake side of the pump.

MECHANICAL SEAL

The pump shaft shall be equipped with a single mechanical type seal on the suction (inboard) side of the pump. The mechanical seal shall be a minimum of two inches in diameter and shall be spring loaded, maintenance free and self-adjusting. The mechanical seal shall be constructed of a carbon sealing ring, stainless steel coil spring, Viton rubber cup, and a tungsten carbide seat with Teflon backup seal.

SACRIFICIAL PUMP ANODES

To aid in protecting the pump from internal corrosion, three sacrificial anodes shall be provided and located one in the

lower section of each side inlet and one on the discharge side of the pump.

FRC IN CONTROL 400 PRESSURE GOVERNOR

Fire Research In-Control TGA400 pressure governor and monitoring display kit shall be installed.

The following continuous displays shall be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high.
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high.
- Pressure / RPM setting; shown on a dot matrix message display.
- Pressure and RPM operating mode LEDs.
- Throttle ready LED. Engine RPM; shown with four daylight bright LED digits more than 1/2" high.
- Check engine and stop engine warning LEDs.
- Oil pressure; shown on a dual color (green/red) LED bar graph display.
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display.
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display.
- Battery voltage; shown on a dual color (green/red) LED bar graph display.

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage.
- Low Battery Voltage (Engine Off).
- Low Battery Voltage (Engine Running).
- High Transmission Temperature.
- Low Engine Oil Pressure.
- High Engine Coolant Temperature.
- Out of Water (visual alarm only).
- No Engine Response (visual alarm only).

The program features shall be accessed via push buttons and a control knob located on the front of the control panel. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor, monitoring and master pressure display shall be programmed to interface with a specific

engine

TFT A-18 INTAKE RELIEF VALVE

A TFT model A-18 intake relief/dump valve shall be provided on the intake side of the pump to relieve excess incoming pressure. The system shall be designed to automatically restore to a non-relieving position when excessive pressure is no longer present. The pressure adjustment range shall be from 50 psi to 200 psi. The relief system shall be adjustable with a common type box end wrench.

The intake relief valve shall be pre-set to 125 psi.

PUMP SHIFT MECHANISM -AIR/ELECTRIC

The pump shall be shifted from road to pump by means of a cab mounted air over electric pump shift switch. The switch shall have a built in positive locking mechanism to prevent accidental movement of the switch. The locking mechanism shall require the operator to manually lift up on the switch lever to disengage the lock.

The switch shall have three positions:

- Position 1 = road position
- Position 2 = neutral position
- Position 3 = pump position

A green indicator light shall be provided in the driving compartment and shall be energized when the pump shift has been completed. This light shall be labeled "PUMP ENGAGED".

When the apparatus is equipped with an automatic transmission, a green indicator light shall be provided in the driver's compartment. It shall be energized when both the pump shift has been completed and the chassis transmission is in pump gear. This light shall be labeled "OK TO PUMP".

TRIDENT AUTOMATIC PRIMING SYSTEM

A Trident automatic air priming system shall be provided.

PRIME MODE SWITCH

A toggle switch shall be provided on the pump panel to choose priming mode. The switch shall be pushed to initially prime the pump. After the pump is primed, the switch may be placed in "auto" mode. The system shall monitor the discharge pressure of the pump and automatically restart the primer if discharge pressure is lost.

The auto prime system shall be interconnected to the pump shift to allow priming activation only in pump mode.

PRIMER PRESSURE PROTECTION VALVE

A pressure protection valve shall be provided in the priming system air line assembly.

MANIFOLD DRAIN VALVE

The pump shall have a manifold type drain valve assembly consisting of a stainless steel plunger in a bronze body with multiple ports. The control for the valve shall be on the left side along the bottom of the panel and above the side running board. The valve shall be a rotary type with a large easy to grip handle. The valve shall be labeled “PUMP DRAIN”.

ICI "LEVER LIFT" BLEEDER/DRAIN VALVES

ICI 3/4" quarter turn ball type bleeder/drain valve shall be provided for each discharge and auxiliary intake. A hose shall be connected to the valve that will direct water below the apparatus and away from the immediate pump operator's location.

The control handle shall be "lever lift" style for easy actuation. The handle for the control shall have a recessed area for the color coded identification label.

6" LEFT (DRIVER) SIDE MASTER INTAKE

A 6" master intake shall be provided on the left (driver) side of the apparatus. The intake shall have a 6" male NST connection. The intake shall have a removable screen to prevent the entry of large objects into the pump. The screen shall be constructed of a material that will provide cathodic protection to the pump. A label shall be provided above the intake that states “DRIVER SIDE MASTER INTAKE". The label shall be color coded burgundy.

LEFT SIDE MASTER INTAKE CAP

A 6" female NST long handle chrome cap shall be provided on the left side master intake.

6" RIGHT (PASSENGER) SIDE MASTER INTAKE

A 6" master intake shall be provided on the right (passenger) side of the apparatus. The intake shall have a 6" male NST connection. The intake shall have a removable screen to prevent the entry of large objects into the pump. The screen shall be constructed of a material that will provide cathodic protection to the pump. A label shall be provided above the intake that states "PASSENGER SIDE MASTER INTAKE". The label shall be color coded burgundy.

RIGHT SIDE MASTER INTAKE CAP

A 6" female NST long handle chrome cap shall be provided on the right side master intake.

FRONT BUMPER INTAKE

A front bumper intake shall be provided and located on the right side of the front bumper.

HALE MIV-E MASTER INTAKE VALVE FOR FRONT INTAKE

The front intake shall be equipped with a Hale model MIV-E electrically operated intake valve. The valve shall be a full flow butterfly type valve designed to mount on the fire pump between the suction tube extension and the suction tube behind the pump panel. The valve shall not interfere with other suction or discharge openings on the fire pump or with

the operating control properly mounted.

The entire valve shall be cast, manufactured, and tested at the pump manufacturer's factory. The valve body and related components that are in contact with water shall be fine grained corrosion resistant bronze. The butterfly disc shall be manufactured of 80,000 psi minimum yield strength heat treated cast steel then coated with a durable nitrile rubber to provide a positive seal when the valve is closed. The valve shall be hydrostatically tested to 600 psig and vacuum tested to 26" hg.

A pressure relief valve shall be provided that is factory set at 125 psi and field adjustable from 75 to 250 psi. The pressure relief valve shall provide overpressure protection for the soft suction hose even when the intake valve is closed.

The inlet valve shall be operated by a 12 VDC electric motor with the control on the pump panel. The valve shall be provided with panel placards indicating control operation. The placards shall have status lights to indicate whether the valve is open, closed, or traversing from one position to the other. The valve shall have a gear operator that will open/close the valve in no less than 3 seconds. The gear actuators shall be sealed to provide reliable service in the hard pump compartment environment. The ratio of the actuator will be such that the handwheel will close the valve in no more than 10 complete turns.

A label stating the following will be provided near the intake: "WARNING-SERIOUS INJURY OR DEATH COULD OCCUR IF INLET IS SUPPLIED BY A PRESSURIZED SOURCE WHEN THE VALVE IS CLOSED.

MANUAL MIV "BACKUP" CONTROL - FRONT INTAKE

A manually operated "backup" handwheel control shall be provided for the front intake valve and located in an accessible location. Because the backup control moves when the electric control is activated, the backup control shall not be located in any location that firefighting personnel may come into contact with the control during normal operations.

FRONT MIV VALVE DRAIN

A 3/4" drain shall be provided on the valve body to allow draining of the outer side of the valve.

FRONT MASTER INTAKE PRE-PRIME

A priming button shall be provided on the pump panel to allow pre-priming of the front master intake when the intake valve is closed.

FRONT INTAKE CONNECTION

A **chrome plated** front suction swivel elbow with 6" male National Standard Threads shall be provided. The elbow shall have a vertical lock to prevent vacuum leaks due to side loads and shall have dual o-rings for a positive seal. The elbow, as well as the swivel bearings, shall be brass for increased durability. A built in strainer shall also be included with the elbow.

BUMPER EXTENSION APRON

An aluminum treadbrite apron shall be provided in the area between the extended bumper and the chassis cab.

FRONT MASTER INTAKE CAP

A 6" female NST long handle chrome cap shall be provided on the front master intake.

HALE TRV-L-120 THERMAL RELIEF VALVE WITH INDICATOR LIGHT

A Hale TRV-L-120 thermal relief valve shall be provided and installed on the discharge side of the pump. The valve shall function automatically when the water temperature in the pump exceeds 120 degrees Fahrenheit. The valve shall discharge a 3/8" stream of water to the booster tank thereby preventing pump overheat. The valve shall be self-resetting after the temperature of the water in the pump drops below 120 degrees Fahrenheit. A pump panel mounted light shall be provided to indicate when the relief valve is open (discharging to tank).

TANK REFILL/RECIRCULATION DISCHARGE

A discharge shall be provided from the pump discharge manifold to allow pump cooling when necessary as well as to refill the booster tank.

The water tank fill gauge shall be directly in line with this discharge control.

The valve and piping shall be 2".

The refill/recirculation discharge shall be electrically actuated from the pump operator's position with an Akron 9323 Navigator Pro valve controller. The controller shall provide valve position indication.

STAINLESS STEEL PIPING

All piping for discharges shall be stainless steel using stainless steel fittings. All piping for discharges shall be stainless steel using stainless steel fittings. High pressure helix wire reinforced flexible piping with a minimum burst pressure of 1200 psi may be used in some areas to minimize friction losses. All flexible piping couplings shall be high tensile strength stainless steel.

All piping shall be properly supported and braced to prevent movement of piping other than what is allowed by the flexible couplings to compensate for apparatus flexing.

Any discharge manifolds provided on the apparatus must be fabricated of a minimum of schedule 10 304 marine grade piping. Use of any welded light gauge (less than Schedule 10) manifolding or plumbing will not be acceptable.

The stainless steel piping shall be warranted to be free from corrosion perforation for a period of 10 years following the delivery of the apparatus.

VICTAULIC COUPLINGS

Victaulic style couplings shall be used in the assembly of the pump piping system. The couplings shall allow flex in the piping and provide for a disassembly point for maintenance and repairs.

VENTED LUG CAPS AND PLUGS

All intake and discharge plugs and caps and plugs shall be vented lug type designed to relieve trapped pressure and help reduce possible operator injuries.

RIGHT SIDE REARWARD AUXILIARY INTAKE

An auxiliary intake shall be provided on the right side of the pump compartment in the rearward position.

The intake valve and piping shall be 2 1/2".

The valve shall be electrically actuated from the pump operator's position with an Akron 9323 Navigator Pro valve controller. The controller shall provide valve position indication.

The intake shall have a 2 1/2" chrome plated female NST swivel connection with screen and a male NST chrome plated intake plug and chain.

A 3/4" bleeder/drain valve shall be provided.

FOAM PRO 1600 CLASS A FOAM SYSTEM

A Foam Pro model 1600 Class A foam system shall be provided and properly installed on the apparatus.

The system shall be an electronic, fully automatic, variable speed direct injection discharge side foam proportioning system. The foam proportioning operation shall be based in direct measurement of water flows and pressures.

The system shall be equipped with a control module, suitable for installation on the pump panel. Incorporated within the motor driver shall be a microprocessor that receives input from the system flowmeter, while also monitoring foam concentrate pump output, comparing values to ensure that the operators preset proportional amount of foam concentrate is injected into the discharge side of the pump.

The control module shall enable the pump operator to 1) activate the foam proportioning system and 2) select the foam proportioning rates from 0.1% to 1.0%.

The foam system shall be capable of the following flow rates at given foam %:

1,700 gpm @ 0.1%
850 gpm @ 0.2%
340 gpm @ 0.5%
170 gpm @ 1%

A 12 volt electric motor driven, positive displacement plunger pump shall be provided. The pump capacity shall be 1.7 gpm at 200 psi with a maximum operating pressure up to 400 psi. The motor shall be controlled by a microprocessor

which is mounted in the base of the pump. It shall receive signals from the control module, and power the 1/3 hp electric motor in a variable speed duty cycle to ensure that the correct proportion of concentrate is injected into the water stream.

A full flow check valve shall be provided in the discharge piping to prevent foam contamination in the fire pump and water tank. A 5 psi opening pressure check valve shall be provided in the concentrate line.

The foam supply shall be provided from the integral foam tank described later in these specifications.

An installation and operation manual shall be provided for the system.

CLASS A "LOW FOAM IN TANK" INDICATOR

There shall be a Foam Pro low tank level indicator provided and vertically mounted in the wall of the foam tank. The indicator shall provide "low foam concentrate" indication to the pump operator.

FOAM SYSTEM SCHEMATIC PLACARD

There shall be a single tank foam system layout placard provided and located in close proximity to the pump operator's position as required by NFPA 1901.

FOAM SYSTEM RATING PLACARD

There shall be a foam system rating placard provided in close proximity to the pump operator's position as required by NFPA 1901.

FOAM CAPABLE DISCHARGES

The two 1 3/4" crosslays, the outer right rear 2 1/2" discharge and the front bumper discharge shall be foam capable.

RIGHT 2 1/2" REARWARD DISCHARGE

One 2 1/2" discharge shall be provided on the right side of the apparatus in the rearward area of the pump panel.

The valve shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve controller. The controller shall provide valve position indication as well as pressure and GPM flow readings.

The discharge shall be equipped with a chrome plated brass or bright finish stainless steel discharge elbow.

A 2 1/2" chrome plated NST cap and chain shall be provided.

RIGHT FORWARD 4" DISCHARGE

One 4" discharge shall be provided on the right side of the apparatus in the forward area of the pump panel.

The valve shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve

controller. The controller shall provide valve position indication as well as pressure and GPM flow readings.

The discharge shall extend straight out of the apparatus with no elbow.

A 4" chrome plated NST discharge cap shall be provided.

LEFT SIDE REARWARD 2 1/2" DISCHARGE

One 2 1/2" discharge shall be provided on the left side of the apparatus in the rearward area of the pump panel.

The valve shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve controller. The controller shall provide valve position indication as well as pressure and GPM flow readings.

The discharge shall be equipped with a chrome plated brass or bright finish stainless steel discharge elbow.

A 2 1/2" chrome plated NST cap and chain shall be provided.

RIGHT REAR 2 1/2" DISCHARGE

One (1) 2 1/2" discharge shall be provided on the right rear of the apparatus.

The valve shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve controller. The controller shall provide valve position indication as well as pressure and GPM flow readings.

A chrome discharge elbow shall be provided.

The discharge shall be used as a pre-connected line and shall not require any cap or chain.

The right rear (passenger) 2 1/2" discharge shall be foam capable.

LEFT REAR 2 1/2" DISCHARGE

One (1) 2 1/2" discharge shall be provided on the left rear of the apparatus.

The valve shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve controller. The controller shall provide valve position indication as well as pressure and gpm flow readings.

A chrome discharge elbow shall be provided.

The discharge shall be used as a pre-connected line and shall not require any cap or chain.

CROSSLAYS

Two 1 3/4" crosslays shall be provided above the pump compartment and below the backboard and stokes basket storage area in the forward transverse compartment.

The crosslays shall have 'drop down' type swivels that allow for connection of the hose at the top of the crosslay.

Each crosslay shall have the capacity for 200' of 1 3/4" fire hose.

The two 1 3/4" speedlays shall have removable trays to allow for reloading hose. The trays shall be constructed of ½" thick black poly material. The trays shall have handhold cutouts on the vertical and horizontal edges.

The valve(s) shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve controller. The controller shall provide valve position indication as well as pressure and GPM flow readings.

1 3/4" CROSSLAY DRAIN VALVES - MANUAL

3/4" manual drain valves shall be provided for all 1 3/4" crosslays. The valves shall have an all brass body with heavy duty neoprene seal.

3" MONITOR DISCHARGE

A 3" monitor discharge shall be provided above the pump compartment. The discharge piping shall extend above the pump compartment a sufficient distance to allow use of the deck gun.

The valve shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve controller. The controller shall provide valve position indication as well as pressure and GPM flow readings.

AKRON DECK MASTER 3440 PERMANENT MOUNT ELECTRIC MONITOR

One (1) Akron Deck Master 3440 electric monitor shall be provided and mounted on the monitor discharge.

The monitor assembly shall be capable of 45 degrees below horizontal to 90 degrees above horizontal and 344 degrees rotation (depending on apparatus design and mounting location). Adjustable stops shall be provided to limit rotation in the area of an obstruction.

AKRON 3401 MONITOR SUPPPORT FLANGE

An Akron model 3401 3" support flange shall be provided to provide additional support to the monitor piping.

AKRON 5177 MASTER STREAM NOZZLE

One (1) Akron 5177 automatic master stream nozzle shall be provided on the monitor. The nozzle shall be combination fog and straight stream with automatic flow mechanism that maintains consistent pressure throughout a flow range of 250 to 1,250 gallons per minute. The nozzle shall have an encased 12 volt DC electric motor with manual override to change the stream pattern. The nozzle shall be constructed of lightweight material and have a 2 1/2" FNST swivel connection.

MONITOR CONTROL

A control panel shall be provided on the pump panel.

2 1/2" FRONT BUMPER DISCHARGE

There shall be one 2 1/2" discharge provided on the driver's side of the apparatus bumper.

The valve shall be electrically actuated from the pump operator's position with an Akron 9325 Navigator Pro valve controller. The controller shall provide valve position indication as well as pressure and gpm flow readings.

The front bumper 2 1/2" discharge shall be foam capable.

FRONT BUMPER HOSE WELL HOSE RESTRAINT

Two Velcro restraint straps shall be provided on the hose well to help secure the hose. The ends of the straps shall have a closed loop handle to allow the straps to be easily opened.

FRONT DISCHARGE HOSE CONNECTION - CHROME SWIVEL

The hose connection for the discharge shall be located immediately adjacent to the hosewell. A **chrome plated or polished stainless steel** swivel shall be provided. The lid for the hosewell shall be notched to allow for the hose to be preconnected.

FRONT BUMPER DISCHARGE HOSE CONNECTION - DRIVER'S SIDE

The hose connection for the front bumper discharge shall be on the driver's side.

The front bumper 2 1/2" discharge shall be utilized as a pre-connected line and shall not require any cap or chain.

PUMP OPERATOR'S PANEL - BLACK VINYL

The pump panel shall be located in the driver's side forward compartment ahead of the rear wheels. The pump panel layout shall provide simple and efficient operation of all pump functions necessary during normal fire ground operation.

The pump panel shall be mounted in the mid-section of the compartment and be designed to extend out for pump operation mode. When in the retracted (stored) position, the panel shall lay flat with the controls facing upward in a protected enclosure. When extended, the panel shall rest in an inclined position to allow easy viewing and use of the controls while the operator stands at ground level.

The panel shall be constructed of black vinyl covered aluminum.

PRESSURE/VACUUM TEST PLUGS

Underwriter's test plug adapters shall be provided for connection of pump test gauges.

INNOVATIVE CONTROLS SL PLUS TANK GAUGE - PUMP PANEL

An Innovative Controls model SL Plus tank gauge shall be provided on the pump panel. The gauge shall feature a 180 degree highly visible wide view ultra-bright LED display showing the level of the booster tank.

INNOVATIVE CONTROLS SL PLUS FOAM TANK GAUGE - CLASS A FOAM

An Innovative Controls model SL Plus class A foam tank gauge shall be provided on the pump panel. The gauge shall feature a 180 degree highly visible wide view ultra-bright LED display showing the level of the booster tank.

PUMP PANEL AIR HORN BUTTON

A momentary push button shall be provided on the pump panel to activate air horns.

IDENTIFICATION LABELS FOR PUMP PANEL

Innovative Controls verbiage label bezels shall be installed. The bezel assemblies will be used to identify apparatus components. These labels shall be designed and manufactured to withstand the specified apparatus service environment.

Where required, the verbiage label bezel assemblies shall include a chrome plated panel mount bezel with durable easy to read UV resistant polycarbonate inserts featuring the specified verbiage and color coding. The UV resistant polycarbonate verbiage and color inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the insert labels and bezel shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

BOOSTER TANK- UNITED PLASTIC FABRICATING, INC.

The tank shall have a LIFETIME warranty provided by United Plastic Fabricating, Inc.

The tank exterior shell shall be constructed of minimum 1/2" thick PT3 polypropylene sheet stock. This material shall be non-corrosive stress relieved thermoplastic which is U.V. stabilized for maximum protection. The booster tank shall be of a specific configuration and is designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The tank construction shall include Poly Pro Seal technology. A sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise.

The transverse swash partitions shall be manufactured of 3/8" PT3 polypropylene material. The longitudinal swash partitions shall be constructed of 3/8" PT3 polypropylene and extend through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions shall interlock with one another and are welded to each other as well as to the walls of the tank. All partition spacing shall be compliant with NFPA 1091 recommendations.

Toyne Inc.

The top of the booster tank shall be fitted with removable lifting eyes.

The tank cradle assembly shall be designed to provide support to the tank. The assembly shall be approved by the manufacturer of the tank.

BOOSTER TANK CAPACITY 1,000 GALLONS

The poly booster tank shall have a capacity of 1,000 U.S. gallons.

BOOSTER TANK FILL TOWER - LEFT SIDE FRONT

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene and shall be a minimum of **10" x 10"** outer dimension. The tower shall be located in the left front corner of the hose bed. The tower shall have a 1/4" thick removable polypropylene screen and polypropylene hinged type cover.

4" TANK OVERFLOW

A 4" diameter tank vent/overflow shall be provided and integrated into the tank. The piping shall be a minimum of schedule 40 polypropylene designed to run through the tank and discharge behind the rear wheels.

1" TANK SUMP DRAIN

A 1" drain shall be provided in the bottom of the tank sump to fully drain the tank. The drain shall use 1" stainless steel piping with a 1" valve. The control for the valve shall be remoted to the driver's side of the apparatus just under and behind the side rub rail. The drain control handle shall be labeled "TANK DRAIN".

3" TANK SUMP CLEAN OUT PLUG

A 3" tank sump clean out plug drain shall be provided in the bottom of the tank sump.

25 GALLON CLASS A FOAM TANK

A 25 gallon Class A foam tank shall be provided. The tank shall have all connections necessary to connect to the foam system and shall also have a 1/4 turn drain valve with hose attached to allow the tank to be drained.

The tank shall have an **8" x 8"** fill tower with hinged type lid with latch. A vent shall be provided in the lid.

A label shall be provided on the lid that reads "CLASS A FOAM TANK FILL" and "WARNING: DO NOT MIX BRANDS OR TYPES OF FOAM".

CLASS A FOAM TANK/BOOSTER TANK INTEGRATION

The class A foam tank shall be integrated into the apparatus booster tank. The foam tank shall not be separate from the booster tank.

3" TANK TO PUMP

A 3" tank to pump line and valve shall be provided between the tank and the pump.

The tank to pump valve shall be electrically actuated from the pump operator's position with an Akron 9323 Navigator Pro valve controller. The controller shall provide valve position indication.

TANK TO PUMP CHECK VALVE

A check valve assembly shall be provided on the pump. The valve shall prevent unintentional back filling of the tank through the tank to pump line. Connection from the valve to the tank shall be made by using a non-collapsible flexible rubber hose.

HOT DIPPED GALVANIZED SUB FRAME

The tank cradle and body substructure shall be constructed of high strength ASTM A-36 structural steel with a 36,000 psi minimum yield strength. The entire substructure shall be framed and jig welded together to insure a truly square assembly. The substructure shall be fastened to the chassis rails so that it may be easily removed from the chassis for repair, replacement or mounting to a new chassis.

After complete assembly of the tank cradle substructure, the entire assembly shall be hot dipped galvanized for superior corrosion protection.

Due to the extreme duty that this apparatus will experience during its intended service life and to prevent rusting and corrosion from shortening the service life of this apparatus, sub frames fabricated of painted/undercoated steel or aluminum tubing shall not be acceptable.

20 YEAR SUB-STRUCTURE WARRANTY

The tank cradle and body substructure shall have a 20 warranty covering failure due to corrosion perforation or structural design error.

This warranty shall be in effect for 20 years after delivery of the apparatus to the customer. **NO EXCEPTION**.

***HYPER-FLEX* BODY MOUNTING**

The body module assembly shall be mounted to the chassis frame rails with "*Hyper-Flex*" vibration and shock isolators using a forward mounting system. Flexible neoprene pads, or U-springs especially developed for the expected weight and torsional flexing of the apparatus body, shall be incorporated into the system to eliminate chassis frame rail flex from transmitting harmful loads and twisting onto the body.

STAINLESS STEEL APPARATUS BODY CONSTRUCTION

The entire apparatus body shall be formed by shearing and bending fire apparatus quality stainless steel sheet metal. Metal tubular structures or extrusions shall not be used in the construction of the apparatus body. All edges of the sheared metal shall be sanded to remove any sharp shear edges prior to bending the metal. After shearing and bending, the body shall be assembled on a jig table that is designed to hold all apparatus body parts securely in place to insure an accurately built apparatus body. After the fabricated body parts are secured on the jig, the body shall be

welded together using a wire welder to insure proper weld penetration.

The entire apparatus body shall be welded together using only unexposed welding methods. No welds shall be visible on the exterior of the apparatus body. All welds on the exterior of the body shall be ground flush and filled with automotive body filler. Metal or rubber trims shall not be used to hide welds or seams.

COMPARTMENT FLOORS

All compartment floors shall be constructed of fire apparatus quality stainless sheet steel. The floors shall have a minimum 1" upward flange on the rear wall of the compartment to prevent any possible moisture accumulation in this area. The sides of the floor must be welded the full depth of the compartment to eliminate moisture accumulation. These welds must be placed on the bottom exterior of the compartment so that they are not visible on the interior of the compartment. The front edge of the compartment shall consist of a minimum of four bends to provide additional strength in the compartment floor and shall then form the lower door jamb.

All compartment floors shall be sweep out design. This shall include the lower side compartments, any upper compartments, and the rear face compartment. Any exception to this requirement will cause immediate rejection of bid.

COMPARTMENT REAR WALLS/BODY SIDES

The compartment rear walls and the apparatus body sides shall be constructed of fire apparatus quality stainless sheet steel. The corners shall be one piece construction from top to bottom and from the inner body panel to the outer face of the compartment to provide maximum strength. Corners using structural support channels or extrusions that require two or more pieces to be welded together shall not be implemented.

SIDE/REAR COMPARTMENT TOPS AND CEILINGS

The side and rear compartment tops and ceilings shall be constructed of fire apparatus quality stainless sheet steel. The ceiling of the lower side compartments in the extended depth section shall also be constructed of this material.

FENDERWELLS

The left and right side rear fender wells shall be constructed of fire apparatus quality stainless steel sheet steel. A 1" gap shall be provided on the bottom of each side of the circular liner to allow drainage of water and for easy cleanout. Sufficient clearance shall be provided for tire chains. The fender wells shall be thoroughly cleaned and sealed.

PAINTED FENDERWELLS

The fender wells shall be finish painted the primary exterior color of the apparatus.

Two prevent potential corrosion points, aluminum treadbrite or bolted on overlapping panels shall not be implemented in the construction of the apparatus body.

REMOVABLE INNER FENDER LINER

The fender wells shall be radius cut and shall have a circular inner liner to prevent rust pockets and for ease of cleaning. The inner liner shall be constructed of high impact polyethylene material and shall be fully removable for chassis suspension access.

REMOVABLE INNER FENDER LINER - NO EXCEPTION

To prevent the accumulation of potential corrosive materials in the fender well area, there shall be no exception to the removable inner fender liner.

STAINLESS STEEL FENDERETTE

The fender wells shall be trimmed with a polished stainless steel fenderette. The stainless steel fenderette shall be secured into place with stainless steel fasteners and shall be easily removable for replacement. A black rubber fender welting shall be provided between the fenderette and the inner liner surface. The fenderettes shall protrude from the apparatus body a maximum of 1".

REPLACEABLE FENDERETTE

The stainless steel fenderette shall be secured to the apparatus body with stainless steel fasteners and shall be easily removable for replacement.

Fenderettes that are welded to the apparatus body are not acceptable.

COMPARTMENT VENTILATION

Each compartment shall have a removable metal ventilation plate to allow for air movement in the compartment. A cleanable filter material shall be provided behind the plate.

Plastic cover plates will not be acceptable.

COMPARTMENT TOP OVERLAY

The compartment tops shall be overlaid with fire apparatus quality aluminum treadbrite. The aluminum treadbrite shall be an overlay only and shall not form any structural part of the apparatus. It shall be fitted on the apparatus body with all holes drilled prior to painting. **Aluminum treadbrite that is welded or bolted to the top of the compartments and masked off during the paint process is not acceptable.** The back side of the aluminum treadbrite shall be fully covered with a high temperature polyurethane based sealer.

ROLL UP COMPARTMENT DOORS- SATIN FINISH

The doors shall be constructed of aluminum extrusion slats. All doors shall be fitted with a flexible, watertight seal between the slats at pivoting joints. Each slat shall be individually removable for replacement in the event of damage.

The end caps and rollers shall be manufactured of type 6 nylon. The doors shall have a pre-tension operator in a sealed alloy drum that is positioned in the upper portion of the compartment, providing maximum clearance and head

room in the upper portion of the compartment.

Each door shall have a full door width lift bar latching handle which shall be spring loaded with two surface mounted latch points, mounted one on each end. The door shall be reinforced and the latch point with a "ledge" surface above the lift bar designed to provide a "push" surface when closing.

Each door shall be provided with seals made of extruded neoprene which are shaped to readily shed water. The side seals are mounted in a special extrusion forward of the curtain track. Drip rails shall be provided above all doors.

NOTE: All compartment doors shall have a satin anodized finish.

STAINLESS STEEL COATED FASTENERS

All fasteners used in the finish construction of the apparatus body shall be marine grade stainless steel. Fasteners that pass through a dissimilar metal panel shall be Magna-Gard, or equal, coated to help prevent metal reaction and corrosion.

As the Magna-Gard, or equal, coating is a "baked on" type coating providing for excellent adhesion to the fastener, spray on type coatings may be used in conjunction with the Magna-Gard, or equal, but not in place of it.

Because dissimilar metal corrosion is a common occurrence on all apparatus and the Magna-Gard (or similar "baked on" coatings) fasteners are commercially available to all manufacturers and is not a proprietary product, there shall be no exception to this requirement.

LEFT SIDE COMPARTMENTS

One compartment shall be provided on the left side of the apparatus ahead of the rear wheels and just in front of the rear wheels. The compartment shall be 67” high x 53” wide x 26” useable depth. The compartment shall have a roll up door with a 59” high x 47” wide opening. This compartment shall provide 54 cubic feet of compartment space.

A compartment shall be provided above the rear wheels on the left side of the apparatus. The compartment shall be 37” high x 63” wide x 26” useable depth. The compartment shall have a roll up door with a 29” high x 53” wide opening. This compartment shall provide 35 cubic feet of compartment space.

A compartment shall be provided behind the rear wheels on the left side of the apparatus. The compartment shall be 67” high x 56” wide x 26” useable depth. The compartment shall have a rollup door with a 59” high x 53” wide opening. This compartment shall provide 56.5 cubic feet of compartment space.

RIGHT SIDE COMPARTMENTS

One compartment shall be provided on the right side of the apparatus ahead of the rear wheels and just in front of the rear wheels. The compartment shall be 67” high x 53” wide x 26” useable depth. The compartment shall have a roll up door with a 59” high x 47” wide opening. This compartment shall provide 54 cubic feet of compartment space.

A compartment shall be provided above the rear wheels on the right side of the apparatus. The compartment shall be 37” high x 40” wide x 26” useable depth. The compartment shall have a roll up door with a 29” high x 53” wide opening. This compartment shall provide 22 cubic feet of compartment space.

A compartment shall be provided behind the rear wheels on the right side of the apparatus. The compartment shall be 67” high x 56” wide x 26” useable depth. The compartment shall have a rollup door with a 59” high x 53” wide opening. This compartment shall provide 56.5 cubic feet of compartment space.

REAR COMPARTMENT

A rear facing compartment shall be provided the rear of the apparatus. The compartment shall be 70” high x 44” wide x 30” useable depth. The compartment shall have a rollup door with a 49” high x 36” wide opening. This compartment shall provide 53 cubic feet of compartment space not including the transverse section.

TRANSVERSE COMPARTMENT

A transverse compartment shall be provided ahead of the side compartments and above the pump compartment. The compartment shall be full width of the apparatus body and be transverse from side to side. The compartment shall provide enclosed storage for two 1 ¾” crosslays on removable trays. Above the crosslay area shall be a 4” high x 22” wide x transverse storage area for backboards as well as a 8 ½” high x 27” wide x transverse area for a stokes basket.

The compartment shall have a roll up door with a 59” high x 29” wide opening. This compartment shall provide 45 cubic feet of compartment space including the crosslay area.

The door shall be equipped with dual latches that will enable the door to be secured just above the crosslays to provide protection to the equipment stored in the upper area of the compartment.

The roll up door will enclose the intake/discharge panel below the transverse compartment.

COMPARTMENT STORAGE CUBIC FEET.

Total exterior compartment storage including all right and left side compartments, forward transverse compartment, rear facing compartment and coffin compartments shall not be less than 350 cubic feet.

COFFIN COMPARTMENTS

Coffin compartments shall be provided above the side compartments on the left side. The compartments shall be 21.5” high x 26” wide (inside) x 214” long. A total of 69 cubic feet of compartment storage shall be provided.

Two aluminum treadbrite access doors shall be provided on each side for access. The doors shall have a 1" raised lip to keep water from running into the compartment. The doors shall be fully weatherstripped and shall have dual flush mounted D-ring latches.

Floor tiles shall be provided on the floor of the compartment in any area that does not have permanently mounted equipment.

LEFT SIDE COFFIN COMPARTMENT LIGHTING

Each left side coffin compartment shall have one 48” ILI track type L.E.D. light mounted in the center of the compartment door opening(s). The lights shall be constructed of an unbreakable type clear poly type flexible material

housed in an aluminum extrusion.

The lights shall function automatically and independently of other compartments when the compartment door is opened.

REAR STEP MATERIAL - NFPA ALUMINUM TREADBRITE

The rear step shall be constructed of NFPA complaint bright finish aluminum treadbrite.

13 1/2" REAR TAILBOARD STEP

A 13 1/2" depth rear tailboard step shall be provided on the apparatus. The rear step shall be the full width of the apparatus body between the extended body sides. The step shall be spaced from the rear face of the apparatus body a minimum of 3/4" for easy wash out.

RECESSED STEP BODY DESIGN

The rear step of the apparatus shall be 'recessed' into the rear of the body to provide additional side compartmentation.

A 'flat back' or beavertail 'fin' design is not acceptable.

RUBRAILS - BRIGHT ANODIZED ALUMINUM

Extruded aluminum rub rails shall be provided on the apparatus body sides. The rub rails shall have a bright finish with anodized coating to protect the finish. The rub rails shall be spaced from the apparatus body a minimum of 1/4" with poly spacers.

The rub rails must be bolted on to the apparatus body to allow easy replacement if damaged. Rub rails that are permanently fastened to the apparatus body by welding or any other permanent method will not be acceptable. **NO EXCEPTION WILL BE ALLOWED TO THIS REQUIREMENT.**

RUB RAIL ENDS

The rub rail ends shall be 'capped' with a high impact resistant black EPDM contoured block.

HOSE BED FLOORING

The floor of the hose bed shall be constructed of fiber reinforced Dura-Dek, or equal, material.

The top portion of each "T" cross section shall measure 1 5/8" wide x 3/16" thick with beaded ends. The vertical portion shall be 3/16" thick tapering out at the bottom to a thickness of 1/2" and have an overall height of 1". The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.

The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. The gray colored coating shall be baked on and include a slip resistant material.

HOSE BED

The hose bed shall be 44" wide x 18" high x 140" depth and shall provide 64 cubic feet of hosebed capacity.

HOSE BED DIVIDER(S) WITH HANDHOLDS

There shall be one (1) hose bed divider(s) to partition off hose. The divider(s) shall be constructed of 3/16" thick aluminum plate material. The lower edge of the divider(s) shall have a two inch, 90-degree bend toward one side and a 2" x 2" x 3/16" aluminum angle welded to the other side.

The divider(s) shall be adjustable by sliding in tracks which are recessed flush into the hose bed flooring, one on front and one on rear. The divider shall be held in place by two bolts on each end.

The upper rear corner of the divider(s) shall have a minimum of a 3" radius cut with 1" aluminum rub plate. **he rear of the divider shall have handhold cutout.**

ALUMINUM TREADBRITE HOSE BED COVER

A hose bed cover shall be provided to protect the hose load from the weather. The cover shall be constructed of 1/8" aluminum treadbrite. The cover shall extend from the front of the hose bed to the rear. The cover shall be hinged on each side and open from the center. The cover shall be heavily reinforced. Pneumatic holders shall be provided to hold the covers in the up position. The hose bed covers shall be incorporated into the door ajar system.

Two NFPA compliant grab rails shall be provided on the rear of the cover.

Due to OSHA regulations, the hosebed cover shall not be used as a walking or standing surface.

HOSEBED COVER OPEN INDICATOR

A 'hosebed cover open' indication system shall be provided in the cab. The indicator shall be connected into the door ajar system.

HOSE BED COVER END COVERS

Heavy duty vinyl end flaps shall extend downward to cover the exposed rear of the bed and from the left side to the right side of the hose bed. Footman loops with velcro straps shall be provided to secure the end cover.

The hosebed cover end cover shall be gray.

HOSE BED COVER LIGHTING - TRACK TYPE LED

Two 48" ILI track type LED lighting assemblies shall be provided and mounted to the inner liner of the first hose bed

door to be opened. The lights shall be shall function automatically when the first door is opened.

HOSE BED BULKHEAD

A bulkhead divider shall be provided in the front area of the hose bed separating the hose bed from the tank fill tower(s). The balance of this area that is not occupied by fill tower or other mounted equipment shall be used as a dunnage compartment.

PASSENGER'S SIDE HYDRAULIC LADDER RACK

An electric over hydraulic ladder rack shall be installed on the passenger's side of the apparatus body. The ladder rack shall be recessed into the side compartments and shall carry the ladders above the side compartments lying flat. A 12 volt electric hydraulic power pack shall be provided to operate the hydraulic cylinder. The pack shall be properly installed with all hydraulic hoses be properly protected and routed to prevent damage to the hoses.

HYDRAULIC RACK - CENTER PIVOT DESIGN

The hydraulic rack shall be of the single center pivot arm design and shall not require any stabilizing arms on the front or rear that hinder access to the side compartment with the rack in the lowered position. The pivot arm and hydraulic cylinder shall be located in the center of the apparatus above the rear wheel well area.

The pivot arm shall be designed to lower to a position that is approximately 15 degrees below horizontal.

HYDRAULIC RACK CONSTRUCTION

The hydraulic rack lowering arms shall be constructed of heavy wall 304 stainless steel tubing. The arms shall be constructed in a 'jig' type fixture to eliminate warping when the arms are welded together.

HYDRAULIC RACK FINISH

After assembly, the stainless steel lowering arms shall be either chrome plated or electro-polished to a bright finish. Lowering arms that are left in a natural material finish, brushed finish or painted finish will not be acceptable.

LADDER BRACKETS

The ladder backets that are provided on the hydraulic ladder rack shall include spring-loaded quick release bright finish handles that are designed to hold all ladders securely in place. The latches shall also be designed to hold remaining ladders in place if one ladder is removed. To prevent ladder wear, the brackets shall be lined with a high impact plastic material at any location where the ladder may come into contact with the bracket or any latching hardware.

HARD SUCTION COMPARTMENT

An aluminum treadbrite compartment shall be provided on the hydraulic ladder rack for two lengths of 10' hard suction hose. The compartment shall have access doors on both ends of the compartment.

Toyne Inc.

PIKE POLE STORAGE

A storage area shall be provided for two straight handle pike poles on the hydraulic ladder rack. The pike poles shall slide in from the rear of the apparatus.

CENTER ARM COVER - BRUSHED STAINLESS

The pivot arm and hydraulic cylinder shall be located in the center of the apparatus above the rear wheel well area shall have a brushed stainless steel cover panel. The cover panel shall be hinged at top with a stainless steel hinge. The cover shall have bottom latches to secure it to the lift arm. The cover shall automatically hinge down with the rack without the need for manual unlatching. When the rack is in the 'up' or 'stored' position, the cover can be unlatched and hinged up for access to the hydraulic mechanism.

HYDRAULIC RACK SAFETY LOCK

An air actuated safety lock shall be provided to lock the rack in the stowed or travel position. The lock shall automatically disengage when the switch that controls the rack is activated.

HYDRAULIC RACK SAFETY INTERLOCKS

An interlock shall be provided that will prevent operation of the hydraulic rack unless the parking brake activated. An interlock system shall also be provided on the side compartment doors that will prohibit the use of the hydraulic rack when any doors that may interfere with the operation of the rack are open.

HYDRAULIC RACK WARNING LIGHTS

Two red LED warning lights shall be provided and installed one on front and one on rear of the rack to provide emergency warning when the ladder is not in the stowed or travel position.

An indicator light shall be provided on the cab console to signal when the hydraulic rack is not properly stowed.

The outward side of the rack shall be stripped with white reflective material to indicate a hazard or obstruction.

HYDRAULIC RACK AUDIBLE WARNING ALARM

An audible warning alarm shall automatically sound when the hydraulic rack is in motion, both and raise and lower mode.

HYDRAULIC RACK OPERATING SWITCH - REAR

The hydraulic rack shall be controlled be a double pole, double throw momentary switch located at the rear of the body in clear view of the rack.

LOW PROFILE HYDRAULIC LADDER

When in the stored position, the ladders shall rest above the right side compartments and to the right of the hosebed.

Due to overall height limitations, there shall be NO EXCEPTION to this requirement.

DUO SAFETY 24' 2-SECTION ALUMINUM LADDER

One (1) Duo Safety 900A 24' NFPA compliant two section aluminum extension ladder provided and mounted.

DUO SAFETY 14' ALUMINUM ROOF LADDER

One (1) Duo Safety model 775A 14' NFPA compliant aluminum roof ladder with folding hooks shall be provided and mounted.

DUO SAFETY 10' ALUMINUM FOLDING ATTIC LADDER

One (1) Duo Safety model 585A 10' NFPA compliant aluminum folding attic ladder shall be provided and mounted.

6" x 10' HARD SUCTION HOSES (2)

Two sections of 6" diameter x 10' length clear lightweight PVC hard suction hose shall be provided.

The hard suction shall be coupled long handle female NST x rocker lug male NST.

The hard suction shall be Kochek brand.

DRIVER'S SIDE FRONT OF WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area in front of the rear axle on the driver's side to hold a total of three (3) spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

DRIVER'S SIDE REAR OF WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area behind the rear axle on the driver's side to hold a total of two (2) spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

NOTE: The door for this compartment shall also cover the chassis fuel fill.

PASSENGER'S SIDE FRONT OF WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area in front of the rear axle on the passenger's side to hold a total of three (3) spare SCBA cylinders.

The compartment shall have a drain port at the low point of the compartment.

OIL DRY COMPARTMENT

An oil dry compartment shall be provided and integrated into the apparatus body in the passenger's side wheel area behind the rear axle.

The compartment shall be designed to roll out of the wheel well area for dispensing oil dry material and for filling. An 8" x 8" hinged fill cover shall be provided on the top of the compartment.

A reflective stripe shall be provided on the front and rear face of the compartment.

WHEELWELL STORAGE COMPARTMENT DOORS – BRUSHED FINISH STAINLESS

Brushed finish stainless steel access doors shall be provided on each wheel well storage compartment in the wheel well.

WHEELWELL SCBA CYLINDER COMPARTMENT RETENTION STRAPS

One 1" wide loop of high visibility yellow webbing shall be installed in each wheel well spare cylinder compartment for each cylinder to be stored in the compartment. The loop(s) shall be designed to loop around the cylinder valve and help prevent the cylinder from sliding out of the compartment if the door is not latched or fails.

ACCESS LADDER

An access ladder shall be provided on the rear of the apparatus to access the upper area of the apparatus.

The ladder shall have a minimum of five open air style stair treads leading to the top of the apparatus. An additional fold down step shall be provided at the bottom. The step shall hinge above the first step and shall stow between the first and second steps while in the travel position. A minimum of 8 inches of clearance shall be provided between the rung and the body or any obstruction.

All necessary circuitry shall be provided to provide indication to the driver through the door ajar system when the step is not securely stowed.

ACCESS LADDER LEFT SIDE MOUNTING

The rear access ladder shall be mounted on the left (driver) side of the apparatus.

8" DEPTH REAR INTERMEDIATE STEP

An 8" depth aluminum treadbrite step shall be provided on the rear face of the apparatus. The step assembly shall be bolted into place using stainless steel fasteners.

NFPA KNURLED FINSH HANDRAILS

All handrails shall be 1 1/4" diameter extruded aluminum "knurled finish" with chrome plated stanchions. Rubber gaskets shall be provided between the stanchions and any painted surfaces.

LEFT REAR VERTICAL HAND RAILS

An NFPA compliant handrail shall be provided on the left rear of the apparatus for boarding the rear step and using the left rear hose bed access steps.

RIGHT REAR VERTICAL HAND RAILS

An NFPA compliant handrail shall be provided on the right rear of the apparatus for boarding the rear step and using the right rear hose bed access steps.

INTERMEDIATE REAR HORIZONTAL HAND RAIL

An intermediate horizontal handrail shall be provided on the rear of the apparatus.

NFPA 1901 CERTIFIED 12 VOLT ELECTRICAL SYSTEM

The 12-volt apparatus body electrical system shall be provided and shall be in compliance with NFPA 1901 testing and certification procedures as follows:

NFPA MINIMUM ELECTRICAL LOAD DEFINITION

The NFPA 1901 defined minimum electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode:

- Propulsion engine and transmission.
- The clearance and marker lights.
- Communication equipment (5 amp default).
- Illumination of all walking surfaces, the ground at all egress points, control and instrumentation panels and 50% of total compartment lighting.
- Minimum warning lights required for "blocking right of way" mode.
- The current to simultaneously operate and fire pump and all specified electrical devices.
- Anything defined by the purchaser, in the advertised specifications, to be critical to the mission of the apparatus.

RESERVE CAPACITY TEST

The first electrical test to be performed will be the Reserve Capacity Test. All items listed in NFPA Minimum Load Definition shall be activated with the engine shut off. After 10 minutes of operation, those items shall be deactivated. After deactivation, the battery system shall have ample reserve to start the engine.

Toyne Inc.

ALTERNATOR PERFORMANCE TEST AT IDLE

An "alternator performance test at idle" test shall be completed. The minimum continuous electrical load shall be activated with the engine running at idle speed. When the engine temperature has been stabilized at idle speed, the battery system shall be tested to detect any battery discharge current.

ALTERNATOR PERFORMANCE TEST AT FULL LOAD

An "alternator performance test at full load" test shall be completed. The minimum continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed for a 2 hour period.

TEST CONDITIONS

All electrical testing shall be performed with the engine compartment at approximately 200 degrees.

12-VOLT WIRING SYSTEM

All 12-volt electrical wiring shall be SXL cross link rated to carry 125% of the maximum current for which the circuit is protected. The wire shall be of sufficient size so that voltage drop in any electrical device does not exceed 10%. All wiring shall be color, number, and function coded with the number and function being printed every 3" along the entire length of all apparatus body wires (as required by NFPA 1901). All wiring shall be routed through heavy duty PVC split loom securely attached and protected against heat, oil, and physical damage. All locations where the wire passes through a body panel shall be protected with electrical grommets.

All connections shall be made using mechanical connectors and be screwed to terminal or junction box with machine screws. Wire nut, insulation displacement, or piercing connections shall not be used.

All circuits shall be provided with properly rated low voltage over current protective devices of the automatic reset type.

Removable access panels shall be provided to provide access to the wire and electrical components.

MULTI-PLEXED ELECTRICAL SYSTEM

The apparatus body electrical system shall incorporate a Multiplexed Electrical System. The multiplex system shall consist of all solid-state components contained inside aluminum extrusions referred to as nodes. Each node shall consist of (24) output channels and (24) input channels. All inputs and outputs will be configured into an electrical harness utilizing Deutsch connectors. The nodes must be waterproof and not require special mounting requirements.

The system, at a minimum, shall be capable of performing the following functions: load management sequencing, switch loads, receive digital and analog signals, perform and report diagnostics, continuously report vehicle status and the system is expandable.

Placement of nodes throughout the apparatus enables a reduction in wire harness bundles, elimination of redundant harnesses and separate circuit boards, relay and circuit breakers, electrical hardware, separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs. The multiplex system shall be field re-programmable and re-configurable by any authorized dealer or service center. This complete system shall eliminate the need for the following separate components or devices: load manager, load sequencer, warning lamp flasher, door open notification system, interlock modules, separate volt meter and ammeter.

Toyne Inc.

The Base System Shall Include:

- Total Load Management
- Load Shedding Capabilities
- Load Sequencing Capabilities
- “On-Board” Diagnostics Readout
- Very Reliable, Solid-State Hardware
- Error Reporting
- Continuous system monitoring and reporting
- Emergency warning lamp flasher
- Door Ajar System
- Field Configurable
- Expandability Capabilities
- Advanced PC Diagnostics

As-built wiring harness drawings and a master circuit list of electrical circuits that the apparatus builder installs shall be furnished in the delivery manuals. These schematics must show the electrical system broken down into separate functions, or small groups of related functions. Schematics shall depict circuit numbers, electrical components, harnesses, and connectors from beginning to end. **A single drawing for all electrical circuits installed by the apparatus builder shall not be accepted**.

VMUX WARRANTY

The VMUX multiplexed electrical system shall be warranted, under normal use and service, for a period of four years. One year parts and labor and the remaining three years parts only.

AUTOMATIC HIGH IDLE FUNCTION

An automatic high idle system shall be installed and will activate whenever the system voltage drops below a determined voltage. The high idle will remain on until adequate voltage is achieved.

REAR LICENSE PLATE LIGHT/BRACKET

A chrome plated LED license plate light shall be provided on the rear of the apparatus.

A license plate mounting bracket shall be provided that spaces the license plate away from the apparatus body.

CLEARANCE LIGHTS/REFLECTORS

All apparatus body clearance lights shall be LED style. All lower clearance lights and reflectors shall be mounted in a manner that provides protection from damage, and shall comply with FMVSS-108 regulations.

MID-MOUNTED SIDE TURN SIGNAL - LED

An amber LED side turn signal shall be provided in the mid-section area of the apparatus on both sides.

PUMP COMPARTMENT LIGHTS (2)

Two Weldon 2630-0000-30 lights shall be provided to illuminate the interior of the pump compartment. The lights shall function with the pump operator's gauge panel light switch.

DUAL TRACK TYPE LED COMPARTMENT LIGHTING

Each apparatus body compartment shall have two track type LED lights vertically mounted in the compartment. The lights shall be constructed of an unbreakable type clear poly type flexible material housed in an aluminum extrusion.

A compartment that is considered a 'full height' compartment shall each have two 48" long light sections and a 'low height' or above wheel compartment shall each have two 18" long sections.

The lights shall function automatically and independently of other compartments when the compartment door is opened. **Compartment lighting systems that are controlled by a single, dash mounted switch are not acceptable**.

COMPARTMENT LIGHT SWITCHES

Each hinged apparatus body door compartment shall have a magnetic style reed indicator switch.

Each roll up door shall have an integral door open indicator magnet in the lift bar. If the bar is not properly closed, it shall activate the "Door Open" light in the cab.

The compartment lights shall function automatically when the door is opened. A master compartment light switch shall not be acceptable.

DOOR AJAR INDICATOR

The apparatus body door ajar warning system shall be connected to the chassis door ajar indicator system.

LED PERIMETER GROUND LIGHTING -three (3)

There shall be three (3) LED perimeter ground lights furnished and installed on the apparatus body. The lights shall have an unbreakable polycarbonate lens and housing. The lights shall be sealed to help prevent moisture entry.

The ground lights shall be activated with the parking brake.

NOTE: Chassis ground lighting is listed in the chassis section of this specification.

LED APPARATUS BODY STEP LIGHTING

All apparatus body and pump steps and running boards shall be illuminated using chrome plated or stainless steel LED lights. The lights shall function automatically with the park brake.

GROUND/STEP LIGHTING CUTOFF SWITCH

A ground/step light cut off switch shall be provided in the cab to allow the driver to disable the ground lights and other lights that activate when the parking brake is set. The switch shall automatically re-set itself when the parking brake is released.

WHELEN TRI-CLUSTER TAILLIGHTS - LED/INCANDESCENT

Whelen 60BTT 4" x 6" LED taillights and 60A00TAR 4" x 6" LED turn signals shall be provided. The backup lights shall be 4" x 6" clear incandescent. A polished trim housing shall be provided, one each side for mounting the tail lights, turn signal lights, and backup lights.

BACKUP LIGHTS PARK FUNCTION

The backup lights shall automatically activate when the park brake is set to provide work lighting at the rear of the apparatus.

ZONE A UPPER WARNING LIGHTING

A Whelen F4N7QLED lightbar shall be mounted on the top of the cab roof. The lightbar shall be 72" in length and mounted with low profile stainless steel brackets.

The lightbar shall have four corner Linear-LED's and four front Linear-LED's (2 red, 2 white).

The lenses on the Officer's side shall be red and the lenses on the Driver's side shall be red.

ZONES B,C,D UPPER WARNING LIGHTING

Six Whelen model 90RR5FRR red LED light heads shall be provided one on each side on the rear and two on each side of the apparatus.

FRONT GRILLE WARNING LIGHTS - CHASSIS PROVIDED

The front grille warning lights shall be provided with the chassis and are listed in the chassis specifications.

INTERSECTION WARNING LIGHTS - CHASSIS PROVIDED

The intersection warning lights shall be provided with the chassis and are listed in the chassis specifications.

MID-SECTION WARNING LIGHTS - CHASSIS PROVIDED

The mid-section warning lights shall be provided with the chassis and are listed in the chassis specifications.

SIDE FACING LOWER REAR WARNING LIGHTS

One Whelen 700 Series red LED light shall be provided shall be provided on each side of the apparatus as low and as far rearward as possible on the apparatus. A chrome bezel shall be provided around the lights.

REAR FACING LOWER WARNING LIGHTS

Two Whelen 600 Series red LED lights shall be provided on the lower rear of the apparatus. A chrome bezel shall be provided around the lights.

WHELEN TAL65 TRAFFIC ADVISOR

A Whelen TAL65 36" 6 lamp LED directional traffic advisor shall be provided and mounted on the rear of the apparatus. The advisor shall be subject to load management shedding to comply with NFPA 1901.

DIRECTIONAL LIGHT MOUNTING - INTERMEDIATE STEP

The arrowstick/advisor shall be either recessed into or mounted under the rear intermediate step.

FRC SPECTRA LED LIGHTING -12 VOLT

Four Fire Research SPA260-Q15 surface mounted light(s) shall be mounted on the apparatus, two on each side. Each light head shall be a 12 volt DC LED and shall create 15,000 lumens.

Two Fire Research SPA900-Q70 surface mounted light(s) shall be mounted on the apparatus, one on each side on the rear. Each light head shall be a 12 volt DC LED and shall create 7,000 lumens.

12 VOLT SCENE LIGHT ACTIVATION SWITCH (1)

A single switch shall be located on the cab control console to activate the 12 volt scene light(s).

FRC SPECTRA FLATBROW LED LIGHT -12 VOLT

One (1) Fire Research model SPA803-Q20 flatbrow mounted light(s) shall be mounted on the apparatus.

The lighthead shall be a 12 volt DC LED and shall draw 18 amps creating 20,000 lumens.

FIRE HELMET MOUNTINGS

Fire helmets will be stored in an exterior compartment and will not be carried in the apparatus cab.

PAINT PROCEDURE - PPG DELFLEET BASE COAT/CLEAR COAT

After the apparatus body has been fully assembled and all mounting holes, etc. have been either punched, machined, or drilled, the apparatus shall be fully disassembled for the paint process.

Masking or taping off of any portion of the apparatus during the paint process shall not be acceptable. All compartment doors shall be painted separate from the apparatus body.

All seams or flanges on the apparatus body shall be caulked or properly sealed to prevent moist-ure accumulation in flanged areas.

APPARATUS BODY PAINTED OFF CHASSIS

The apparatus body shall be painted prior to being mounted on the chassis. Painting of the body off the chassis will prevent primer and paint overspray on the cab, frame rails and other critical components of the apparatus and drivetrain.

There shall be no exception to this requirement.

PPG CERTIFIED 10 YEAR LIMITED PAINT WARRANTY

The apparatus body exterior finish paint shall have a 10 year limited warranty. The warranty shall be certified by the manufacturer of the paint. Documentation of this shall be provided to the end user. Any warranty that is extended by the apparatus manufacturer and not backed by the paint manufacturer will not be acceptable.

PPG Commercial OEM Product Warranty Coverage:

Warranty Inclusions:

- Delamination of the topcoat and/or other layers of paint.
- Cracking or checking due to failure of the product.
- Excessive loss of gloss caused by cracking, checking and hazing.

Warranty Exclusions:

- Paint deterioration caused by blisters, bubbles, flaking or other degradation due to rust or corrosion originating from the substrate.
- Hazing, chalking or loss of gloss caused by improper care, abrasive polishes, cleaning agents, heavy-duty pressure washing, or aggressive mechanical wash systems.

- Paint deterioration caused by abuse, scratches, chips, gloss reduction, accidents, acid rain, chemical fallout, road treatment materials/chemicals or acts of nature.
- Any paint that was not applied by Toyne, Inc.
- Claims presented without proper Warranty documentation.
- Failure on finishes performed by Non-PPG Commercial Certified Technicians.
- Failure on finishes due to inadequate film builds.
- Failures due to improper cleaning or surface preparation or failure to follow the product use instructions.

THESE ARE THE ONLY WARRANTIES THAT PPG MAKES, AND ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATIONS, ANY WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR USE, ARE DISCLAIMED BY PPG.

ELECTROLYSIS CORROSION CONTROL

The apparatus shall be assembled using ECK or electrolysis corrosion control, on all high corrosion potential areas, such as door latches, door hinges, trim plates, fenderettes, etc. This coating is a high zinc compound that shall act as a sacrificial barrier to help minimize electrolysis and corrosion between dissimilar metals. This shall be in addition to any other barrier material that may be used.

TWO TONE APPARATUS BODY PAINT

The apparatus body shall have a two tone upper/lower paint scheme. The paint divide line shall follow the tops of the compartment.

APPARATUS BODY UNDERCOATING

The apparatus body shall be undercoated after assembly is completed. A bituminous based automotive type undercoat shall be used. Care shall be taken to avoid undercoat application to items that would hinder normal maintenance.

APPARATUS BODY COMPARTMENT INTERIOR FINISH

The interior of all apparatus body compartments shall be finished with a gray textured coating.

LETTERING

The Fire Department shall provide and install all vehicle lettering and numbering.

8" NFPA REFLECTIVE STRIPE

An 8" reflective stripe shall be applied to the apparatus. The stripe shall be applied to a minimum of 50% of the length of the apparatus on each side and 25% across the front of the apparatus. The stripe shall comply with NFPA 1901 requirements.

PRIMARY REFLECTIVE STRIPE COLOR - WHITE

The primary reflective stripe shall be 680-10 white.

REFLECTIVE STRIPE - HORIZONTAL

The reflective stripe shall be applied in a straight horizontal line from front to rear. The height of the stripe on the chassis cab and the body shall be as close as possible.

REAR CHEVRON STRIPING

A minimum of 50 percent of the rear vertical surface of the apparatus shall be covered with 6 inch alternating red and fluorescent yellow green retro-reflective striping. The striping shall slope downward away from the centerline of the apparatus at a 45-degree angle.

The retro-reflective material shall conform to the requirements of ASTM D 4956 "Standard Specification for Retro-Reflective Sheeting for Traffic Control", Type I or better.

FUEL TANK ACCESS

A removable panel shall be provided on the rear of the apparatus for maintenance access to the top of the fuel tank.

ENGINE HORIZONTAL EXHAUST

Shielding shall be provided between the apparatus body and the exhaust pipe if necessary to deflect heat away from the body. The exhaust system shall be designed and installed to comply with EPA equipment requirements and shall not be modified.

LEFT (DRIVER'S) SIDE FUEL FILL DOOR

A chassis fuel fill shall be located in the driver's side rear wheel well. The fill shall be located behind a brushed stainless steel hinged door with flush latch. The fuel fill shall be properly vented.

FRONT MUD FLAPS

Heavy duty black rubber mud flaps shall be provided on the front wheels. The mud flaps shall be attached to the apparatus in the wheel well area using heavy duty stainless steel retention straps that are secured into place using stainless steel fasteners.

REAR MUD FLAPS

Heavy duty black rubber mud flaps shall be provided on the rear wheels. The mud flaps shall be attached to the apparatus in the rear wheel well area using heavy duty stainless steel retention straps that are secured into place using stainless steel fasteners.

FRONT/REAR AXLE NUT COVERS AND BABY MOONS

The front and rear axles shall have stainless steel nut covers and baby moons.

REAR WINCH HITCH RECEIVER

A Class 3 receiver shall be provided on rear of the apparatus for use with a removable winch connection. A quick connect battery power lead with dust cover shall be provided.

LEFT SIDE (DRIVER) WINCH HITCH RECEIVER

A Class 3 receiver shall be provided behind the rear wheels on the left side of the apparatus for use with a removable winch. A quick connect battery power lead with dust cover shall be provided.

RIGHTSIDE (PASSENGER) WINCH HITCH RECEIVER

A Class 3 receiver shall be provided behind the rear wheels on the right side of the apparatus for use with a removable winch. A quick connect battery power lead with dust cover shall be provided.

WINCH RECEIVER SAFETY FACTOR

The winch receiver(s) shall have a 2.0 to 1 straight line pull no-yield safety factor.

REAR PULLING EYES

Two rear 3/4" CRS pulling eyes shall be provided under the rear tailboard. The eyes shall have a minimum of a 3" clear opening for passing chains through the eye.

BATTERY DANGERS LABEL - FAMA01

A permanent label shall be provided near the battery location that warns of potential injury or death that could be caused by the batteries. The label shall also state precautions that should be taken while working on or around the batteries.

ROTATING SHAFTS DANGER LABEL - FAMA02

A permanent label shall be provided on each side of the frame rail and in any other location(s) where rotating shaft hazards are apparent. The label shall warn of potential injury or death that could be caused by the movement of the shaft(s) as well as precautions that should be taken while working on or around them.

HOT SURFACE DANGERS LABEL - FAMA03

A permanent label shall be provided near any hot surface that warns of potential injury or death that could be caused by contact with the surface. The label shall also state precautions that should be taken while working on or around the surface.

HOT EXHAUST DANGERS LABEL - FAMA04

A permanent label shall be provided near any hot exhaust surface that warns of potential injury or death that could be caused by contact with the surface. The label shall also state precautions that should be taken while working on or

around the surface.

SPINNING ENGINE FAN DANGER LABEL - FAMA05

A permanent label shall be provided on both sides of the engine fan. The label shall warn of potential injury or death that could be caused by the movement of the fan as well as precautions that should be taken while working on or around them.

SEATED AND BELTED WARNING LABEL - FAMA07

A permanent label shall be provided that is visible to all occupants that states that they should be seated and belted while the apparatus is in motion. The label shall also state potential injuries or death that could be caused if the safety belts are not used properly.

AIR CONDITIONING REFRIGERANT WARNING LABEL - FAMA09

If the apparatus is equipped with any type of air conditioning system, a permanent label shall be provided that is located in an area that would be visible to service personnel. The label shall state that the system contains R134A, the necessary precautions that should be taken and the dangers of working on or around the system.

CAB INTERIOR EQUIPMENT MOUNTING DANGER LABEL - FAMA10

A permanent label shall be provided inside of the cab warning of the dangers of unsecured equipment inside the cab. The label shall state that all equipment shall be properly secured and also warn of potential injury or death that could be caused by failing to do so.

SCBA SEAT DANGER LABEL - FAMA11

If the apparatus is equipped with SCBA seats in the cab, a permanent label shall be provided inside of the cab warning of the dangers of using the seat without the SCBA properly secured or seat insert in place. The label shall warn of potential injury or death that could be caused by improper use of the seat.

FIRE SERVICE TIRE RATING LABEL - FAMA12

A permanent label shall be provided inside of the cab in view of the driver while entering the cab warning of the dangers of improper use of the tires on the apparatus. The label shall also warn of potential injury or death that could be caused by improper tire use or condition.

ELECTRONIC STABILITY CONTROL LABEL - FAMA13

If the apparatus is equipped with an electronic stability control system, a permanent label shall be provided inside of the cab in view of the driver warning of the dangers of improper operation of the apparatus and the importance of safe driving. The label shall also warn of potential injury or death that could be caused by improper operation of the apparatus.

MAXIMUM OCCUPANCY LABEL - FAMA14

A permanent label shall be provided inside of the cab in view of the driver stating the maximum number of personnel that can ride in the apparatus. The label shall also warn of potential injury or death that could be caused by exceeding the stated capacity.

DO NOT WEAR HELMET LABEL - FAMA15

A permanent label shall be provided inside of the cab in view of all seated positions stating that helmets should not be worn in cab. The label shall also warn of potential injury or death that could be caused by wearing helmet in cab.

VEHICLE BACKING LABEL - FAMA17

A permanent label shall be provided inside of the cab in view of the driver advising of proper procedures to following when the apparatus is in reverse motion. The label shall also warn of potential injury or death that be caused by failing to follow proper procedures.

INTAKE/DISCHARGE CAP PRESSURE LABEL - FAMA18

A permanent label shall be provided in all areas that intakes and discharges are capped. The label shall give instruction on how to properly remove the cap. The label shall also warn of potential dangers, injury or death that be caused by failing to follow proper cap removal procedures.

DO NOT MIX BRAND/TYPES OF FOAM LABEL - FAMA19

A permanent label shall be provided near the foam controls warning operator not to mix brands and types of foam. The label shall also warn of potential dangers, equipment failures or injury or death as a result of poor conditions.

LADDER RACK WARNING LABEL - FAMA21

A permanent label shall be provided on the front and rear area of the ladder rack to provide warning to stay clear of area around the moving rack and that the equipment could cause injury or death.

HOSE RESTRAINT LABEL - FAMA22

A permanent label shall be provided near any hose storage area. The label shall instruct the operator to insure that all hose is properly secured prior to placing the apparatus in motion and to provide warning of potential dangers, including injury or death, in failing to do so.

ACCESS STEPS/LADDER LABEL - FAMA23

A permanent label shall be provided at any area of the apparatus where personnel will be boarding or exiting the apparatus. The label shall instruct the operator in the proper method of climbing into or onto the apparatus as well as exiting and provide indication of potential injury or death that could occur in failing to do so.

DO NOT RIDE ON REAR STEP WARNING LABEL - FAMA24

A permanent label shall be provided at the rear step area stating that riding in this area while the vehicle is in motion is prohibited and shall warn of the potential dangers, including injury or death, in doing so.

TRAINED OPERATOR ONLY LABEL - FAMA25

A permanent label shall be provided on the pump panel that states that only properly trained personnel should operate the apparatus and shall indicate that injury or death could occur as a result.

NOT A STEP WARNING LABEL - FAMA26

A permanent label shall be provided in any horizontal location that a firefighter may feel tempted to use as a step but is not designed, constructed or intended to be a stepping, standing or walking surface. The label shall state that the surface is not intended for this purpose and indicate potential injury or death in doing so.

COMPARTMENT TOP WARNING LABEL - FAMA26

A permanent label shall be provided on the front and rear of the compartment tops on both sides warning that the area is not designed, constructed or intended to be a stepping, standing or walking surface. The label shall state that the surface is not intended for this purpose and indicate potential injury or death in doing so.

HOSEBED COVER WARNING LABEL - FAMA26

A permanent label shall be provided on the front and rear of the hosebed cover warning that the area is not designed, constructed or intended to be a stepping, standing or walking surface. The label shall state that the surface is not intended for this purpose and indicate potential injury or death in doing so.

FRONT BUMPER EXTENSION WARNING LABEL - FAMA26

A permanent label shall be provided on the front bumper extension warning that the area is not designed, constructed or intended to be a stepping, standing or walking surface. The label shall state that the surface is not intended for this purpose and indicate potential injury or death in doing so.

CAB TILT WARNING LABEL - FAMA41

A permanent label shall be provided inside the driver's door warning of potential injury or death that could be received in the area under or around a tilted cab. The label shall also state safety precautions that should be taken when the cab is tilted.

SIREN NOISE WARNING LABEL - FAMA42

A permanent label shall be provided inside the driver's door warning of potential injury that could be received from the noise of the siren. The label shall also state safety precautions that should be taken when the siren is in use.

FLUID CAPACITY LABEL

A permanent plate shall be mounted in the driver's compartment specifying the quantity and type of the following fluids used in the apparatus (if applicable) for normal maintenance:

- Engine oil.
- Engine coolant.

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

LENGTH, HEIGHT, WEIGHT LABEL

A permanent plate or label shall be provided in the cab stating the overall length, height and the gross vehicle weight rating (GVWR), in tons, of the completed apparatus.

The wording on this label shall indicate that the information on the plate/label was current at the time of manufacture and if the overall height of the apparatus changes while the vehicle is in service, the purchaser shall revise the height dimension on the plate.

FOAM SYSTEM PERFORMANCE SPECIFICATION LABEL - NFPA

A label shall be permanently attached to the apparatus near the operator’s control panel. The label shall state the following information pertaining to the performance operating specifications of the foam system:

- Foam classification type.
- Maximum and minimum proportioning rates (%).
- Maximum and minimum water flow (GPM).
- Maximum and minimum operating pressures.
- The statement "Use only concentrates that are compatible with this foam proportioning system. Refer to the foam proportioning system manufacturer's operating manual".

PUMP CERTIFICATIONS

Where applicable, the following documents shall be provided with the completed apparatus:

- Pump manufacturer's certification of suction capability.
- Special condition certifications, if any.
- Pump manufacturer's approval for stationary pumping.
- Engine manufacturer's certified brake horsepower curve showing maximum governed speed.
- Pump manufacturer's certification of hydrostatic test.
- Pump manufacturer's certification of hydrodynamic test, if required. Certification of inspection and tests for the fire pump.

FOAM SYSTEM TEST/CERTIFICATION

The foam system shall be properly installed, tested and certified to NFPA 1901 20.11. The system manufacturer's certification of accuracy and the installe'rs certification shall be provided with the completed apparatus.

OPTICAL WARNING LIGHT CERTIFICATION

The emergency warning light system shall be certified using one of the available methods provided for in NFPA 1901 13.8.16.

SIREN CERTIFICATION

The siren manufacturer shall certify the siren to NFPA 1901 13.9.1.1.

ELECTRICAL SYSTEM PERFORMANCE CERTIFICATION

A written load analysis and the results of the electrical system performance test shall be provided with the completed apparatus. The load analysis shall include the following:

- Nameplate rating of the alternator.
- The alternator rating under the conditions specified in NFPA 1901 13.3.2.
- Each of the component loads specified in NFPA 1901 13.3.3 that make up the minimum continuous electrical load.
- Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load.
- Each individual intermittent electrical load.

BOOSTER TANK CAPACITY CERTIFICATION

The manufacturer shall certify the capacity of the booster tank. Certification shall be documented on the Manufacturer's Record of Construction document.

NPFA SLIP RESISTANCE CERTIFICATION

Any materials used as a stepping, standing or walking surface shall be certified to be compliant with NFPA 1901 15.7.4. Documentation shall be provided with the completed apparatus.

WEIGHT CERTIFICATION

Documents from a certified scale showing actual loading on the front, rear and overall apparatus shall be provided. The apparatus shall be scaled with the water tank full but without personnel, equipment and hose.

VEHICLE ROLLOVER STABILITY

The apparatus chassis shall be equipped with a stability control system and shall be certified to NFPA 1901 Rollover Stability requirements.

UNDERWRITER'S LABORATORIES TESTING

The apparatus shall undergo an Underwriter's Laboratories Certification Test to insure that the completed apparatus meets the requirements of NFPA 1901. The certificate shall be provided to the purchaser upon completion. Underwriter's Laboratories shall also perform the required testing on the entire installed electrical system. Self-certification by the apparatus manufacturer will not be acceptable.

MANUFACTURER'S RECORD OF APPARATUS CONSTRUCTION

All information required to comply with NFPA 1901 4.20.1 shall be provided with the completed apparatus.

OPERATIONS AND SERVICE DOCUMENTATION

The apparatus shall be complete with all operation and service documentation covering the apparatus as delivered and accepted. The documentation shall address the inspection, service and operations of the apparatus and all major components as required in NFPA 1901 4.20.2.

"AS BUILT" APPARATUS BODY OWNERS MANUALS (2)

Two "as built" apparatus body owner's manual USB drives shall be provided with the apparatus. All apparatus body electrical schematics shall be provided as well as all instructional and maintenance manuals on components provided and permanently mounted on the apparatus. A copy of the final apparatus body build specifications shall also be included on the drive. The USB shall be "read only" and shall not allow modification.

To eliminate component confusion, generic documentation with equipment that is not provided on the apparatus body shall not be acceptable.

FAMA FIRE APPARATUS SAFETY GUIDE

One (1) FAMA Fire Apparatus Safety Guide(s) shall be provided with the completed apparatus.

STATEMENT OF EXCEPTION - NFPA MISCELLANEOUS REQUIRED EQUIPMENT

The customer shall be responsible for providing all NFPA required miscellaneous equipment that is not contained within these specifications. All required equipment must be properly installed on the apparatus and in working condition prior to the apparatus being placed into service.

FAMILIARIZATION AND DEMONSTRATION

Upon completion of the new apparatus, an authorized properly trained representative of the manufacturer shall perform a "Familiarization and Demonstration" overview of the apparatus and related components.

The Department shall provide the representative with a written list, by full proper names, of the individual(s) that are to receive the overview. Upon completion of the overview, each person in attendance will be required to acknowledge, by signature, that they understand the operation of the apparatus and all related components.

CHASSIS FAMILIARIZATION

Familiarization of the apparatus shall include the following:

- How to locate gauges or indicators and check all fluid levels and operational use of the apparatus.
- How to tilt the chassis cab or hood assembly for access to the engine, fire pump (if applicable), or aerial control (if applicable), or any other device to allow access to fluids or for required maintenance.
- Interior cab controls, instruments, mirrors, safety devices or alarms, brake operations, transmission control, pump controls (if applicable) exhaust regeneration (if applicable), seat adjustments, warning light engagement and other operational equipment.

FIRE PUMP FAMILIARIZATION

Familiarization of the apparatus shall include the following items related to the fire pump system:

- Setting the parking brake, proper transmission gear and the fire pump engagement operations.
- Throttle control.
- Primer and tank-to-pump operation.
- Use of pressure control device.
- Tank refilling operations.
- Proper operation of discharge controls.
- Proper shutdown and draining of the system.

FOAM SYSTEM FAMILIARIZATION

Familiarization of the apparatus shall include the following items related to the foam system:

- Start up, operation and shut down of the foam system.
- Setting of foam percentages and other operational settings.
- Proper flushing and draining of the system.

POST ACCEPTANCE TRAINING REQUIREMENTS

After apparatus acceptance, the Department shall be responsible for ongoing training of personnel. The Department shall not allow untrained or undertrained personnel to operate the apparatus or any included feature of the apparatus.