

# Toyne, Inc

00-10-1050

## **CERTIFICATION OF NFPA 1901 COMPLIANCE**

As per NFPA 1901, the Purchaser shall assume the responsibility of determining, prior to the purchase of the apparatus, who will be responsible for ensuring that all aspects of NFPA 1901-2009 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 1901-2009 Standard. If the purchaser has elected to provide, perform, outsource and/or contract with a third party, any item required by NFPA 1901-2009 (per the previous paragraph), the manufacturer shall provide, upon delivery, a "Statement of Exceptions" per Chapter 4 of NFPA 1901-2009.

This "Statement of Exceptions" shall include:

1. A separate specification of the section of the NFPA Standard for which the apparatus is lacking compliance.
2. A description of the particular aspect of the apparatus that is not compliant.
3. A description of the further changes or modifications to the delivered apparatus which must be completed to achieve full compliance.
4. An identification of the entity who will be responsible for making the necessary post-delivery changes or modifications to the apparatus to achieved full compliance with the applicable 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 1901-2009.

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## **NFPA REQUIRED EQUIPMENT**

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

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## **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.

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## **HALE MODEL AP50 - 500 GPM PTO PUMP**

The fire pump shall be a Hale Fire Pump Company model AP50 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.

02-95-0400

## **PUMP PERFORMANCE - 500 U.S. GPM**

The pump shall be a single stage centrifugal with a capacity of 500 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.

04-03-0827

## **FRC PUMP BOSS PRESSURE GOVERNOR SYSTEM**

Fire Research PumpBoss pressure governor and monitoring display kit shall be installed. The kit shall include a control module, pressure sensor, and cables.

The following continuous displays shall be provided:

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

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

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

High Engine RPM  
Pump Overheat  
High Transmission Temperature  
Low Battery Voltage (Engine Off)  
Low Battery Voltage (Engine Running)  
High Battery Voltage  
Low Engine Oil Pressure  
High Engine Coolant Temperature

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

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 and monitoring display shall be programmed to interface with a specific engine.

04-07-0300

## **CLASS 1 INTAKE RELIEF VALVE**

A Class 1 intake relief/dump valve shall be provided in the intake side of the pump to relief excess incoming pressure. The system shall be designed to self-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 pressure setting shall be preset by the apparatus manufacturer at a 125-PSI position.

The surplus water shall discharge to the atmosphere at a location away from the pump operator's position.

04-12-1600

## **PTO PUMP SHIFT MECHANISM -ELECTRIC**

The PTO pump shall be shifted from road-to-pump by means of a cab mounted switch controlling an electric "hot shift" control.

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 be provided in the driver compartment and at the pump operators position and 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". The light on the pump panel shall be positioned adjacent to, and preferably above, the throttle control mechanism and shall be marked "WARNING: DO NOT OPEN THROTTLE UNLESS LIGHT IS ON". The pump panel light shall also be energized when the chassis transmission is in the neutral position and the parking brake is engaged.

04-12-4100

## **HALE MODEL ESP-PVG OIL LESS PRIMING SYSTEM**

A Hale model ESP oil less priming system shall be provided with PVG panel mounted control valve. The priming pump shall be an electrically driven, positive displacement vane type conforming to standards outlined in National Fire Protection Association 1901. One (1) priming control shall both open the priming valve and start the priming motor.

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The primer shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds with the pump dry and using 20 feet of appropriately sized hard suction hose with strainer. The system shall develop a vacuum of 22 inches at an altitude of up to 2,000 feet above sea level. The vacuum test shall be performed with a capped 20-foot length of hard suction hose, developing a vacuum of at least 20 inches with a drop not exceeding 10 inches in 5 minutes.

The environmentally friendly priming system shall not require any priming lubricant.

04-12-5050

## **PRIMER FUSE**

The primer shall be protected with a 250 amp fusible link that is designed to protect the apparatus 12 volt electrical system if the primer motor malfunctions.

04-12-6200

## **SUPPLEMENTARY HEAT EXCHANGER**

A supplementary heat exchanger cooling system shall be provided on the pump drive engine. Proper valving shall be installed to permit water from the discharge side of the fire pump to temper the engine coolant circulating through the heat exchanger system without intermixing. The heat exchanger shall be adequate in size to maintain the temperature of the coolant in the pump drive engine not in excess of the engine manufacturer's temperature rating under all pumping conditions.

Appropriate drains shall be provided to allow draining the heat exchanger to prevent damage from freezing. A valve control shall be provided on the pump operators panel. The valve control handle shall be of the rotary type and shall have an arrow indicator that identifies the opened/closed position of the valve.

04-12-8300

## **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 below the left side master intake and above the side running board. The valve shall be a rotary type with large, easy to grip, handle. The valve shall be labeled PUMP DRAIN.

04-12-9300

## **BLEEDER/DRAIN VALVES**

A 3/4" quarter turn Class 1 model 3/4BV ball type bleeder/drain valve shall be provided for each discharge and auxiliary intake. A hose shall be connected to the bleeder/drain that will direct water below the apparatus and away from the immediate pump operator's location.

04-91-1215

## **4 1/2" LEFT (DRIVER) SIDE MASTER INTAKE**

A 4 1/2" master intake shall be provided on the left (driver) side of the apparatus. The intake shall have a 4 1/2" male National Standard Thread 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

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MASTER INTAKE". The label shall be color coded burgundy.

04-95-0100

## **LEFT SIDE MASTER INTAKE CAP**

A 4 1/2" female NST long handle chrome cap shall be provided on the left side master intake.

05-02-1215

## **4 1/2" RIGHT (PASSENGER) SIDE MASTER INTAKE**

A 4 1/2" master intake shall be provided on the right (passenger) side of the apparatus. The intake shall have a 4 1/2" male National Standard Thread 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.

05-06-9135

## **RIGHT SIDE PUMP PANEL COMPARTMENT**

A compartment shall be provided on the right side of the apparatus under the intake and discharge. The compartment shall be a minimum of 33" wide x 15" high x 21" depth.

An aluminum treadbrite hinged down door shall be provided to enclose the compartment.

05-07-7600

## **RIGHT SIDE MASTER INTAKE CAP**

A 4 1/2" female NST long handle chrome cap shall be provided on the right side master intake.

05-60-0300

## **HALE TRV120 THERMAL RELIEF VALVE**

A Hale model TRV120 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 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.

05-90-0201

## **2" TANK REFILL/RECIRCULATION DISCHARGE**

A 2" tank refill and pump recirculation line shall be provided from the discharge side of the pump into the tank. The control for the discharge shall be on the pump operators panel. The discharge shall be attached to the tank using flexible hose.

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

05-90-0371

## **TANK REFILL VALVE - HALE MANUAL CONTROL**

A Hale Torrent discharge valve( shall be utilized on tank refill line The valve shall be manually controlled

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from the pump operator's position.

06-02-0505

## **STAINLESS STEEL PIPING**

All piping for discharges shall be stainless steel using stainless steel fittings. Victaulic couplings shall be used in all front, rear and side discharges, deck pipes, and cross lay hose beds for quick, simple removal of any pipe section or valve for maintenance.

High-pressure flexible helix wire reinforced 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 Victaulic couplings to compensate for apparatus flexing.

Any discharge manifolds provided on the apparatus must be fabricated of minimum Schedule 10, 304-marine grade piping, minimum of 4" in diameter. The manifold must be fabricated and warranted by the apparatus manufacturer. Use of any welded light gauge (less than Schedule 10) manifolding or plumbing, shall not be acceptable.

06-02-0525

## **STAINLESS STEEL PIPING WARRANTY**

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.

06-02-2000

## **VENTED LUG CAPS AND PLUGS**

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

06-06-0200

## **2 1/2" LEFT SIDE AUXILIARY INTAKE(S)**

One (1) 2 1/2" auxiliary intake(s) shall be provided on the left side of the apparatus pump compartment. The intake(s) shall be controlled from the pump operator's position.

06-06-2000

A Hale Torrent stainless steel suction valve(s) shall be utilized on the left side 2 1/2" intake(s) and shall be located **within the pump compartment**. The valve shall be manually controlled from the pump operator's position.

06-06-8000

A 2 1/2" chrome plated female National Standard Thread swivel connection with screen shall be provided on the left side 2 1/2" intake(s) with a chrome plated male National Standard Thread intake plug with chrome plated chain.

06-06-8100

A 3/4" bleeder/drain valve shall be provided on the left side auxiliary intake.

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## **RIGHT 2 1/2" DISCHARGE(S)**

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

07-01-3200

A Hale Torrent stainless steel discharge valve shall be utilized on each right side 2 1/2" discharge and shall be manually controlled from the pump operator's position.

07-01-8000

Each right side 2 1/2" discharge shall be equipped with a chrome discharge elbow that is cast as an integral part of the valve.

07-02-1000

A 2 1/2" chrome plated National Standard Thread discharge cap shall be provided on the right side 2 1/2" discharge(s) with a chrome plated chain.

07-10-9100

## **LEFT 2 1/2" DISCHARGE(S)**

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

07-11-3200

A Hale Torrent stainless steel discharge valve(s) shall be utilized on the left side 2 1/2" discharge(s). The valve shall be manually controlled from the pump operator's position.

07-11-8000

The left side 2 1/2" discharge(s) shall have chrome discharge elbows that are cast as an integral part of the valve.

07-12-1000

A 2 1/2" chrome plated National Standard Thread discharge cap shall be provided on the left side 2 1/2" discharge(s) with a chrome plated chain.

07-52-4900

## **1 3/4" CROSSLAY PRECONNECTS**

Two 1 3/4" preconnected crosslays shall be provided and located above the side mount pump panel.

The crosslay compartment shall be constructed of 5052 smooth aluminum sheet material with a random brushed finish applied after fabrication. Each crosslay shall be piped using 2" piping or high pressure hose incorporating a 2" ball valve with the control on the pump operators panel.

07-52-9100

## **# 1 - 1 3/4" CROSSLAY CAPACITY - 200 FEET**

The # 1 - 1 3/4" crosslay shall have the capacity to hold 200 feet of 1 3/4" fire hose and nozzle.

07-52-9106

## **# 2 - 1 3/4" CROSSLAY CAPACITY - 200 FEET**

The # 2 - 1 3/4" crosslay shall have the capacity to hold 200 feet of 1 3/4" fire hose and nozzle.

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07-53-3100

Two (2) Hale Torrent stainless steel series discharge valves shall be utilized to control the 1-3/4" cross lay hose beds and shall be manually controlled from the pump operator's position. The valves and piping shall be 2".

07-55-0000

There shall be two (2) 2" swivel elbows with 1 1/2" Male NST hose thread connections provided on the 1-3/4" cross lay hose beds. The swivels shall be mounted in a position to prevent hose "pinching" at the hose thread connection.

07-55-1100

## **AUTOMATIC CROSSLAY DRAIN VALVES**

3/4" automatic drain valves shall be provided for all crosslays. The valves shall have an all brass body with heavy duty neoprene seal. The valve shall be normally open and shall close at 6psi using an all brass check assembly with stainless steel spring.

07-56-1100

## **CROSSLAY COMPARTMENT ENDS**

The crosslay compartment shall be enclosed on each end using a heavy duty webbing to prevent hose from accidentally unloading.

A nozzle strap shall be provided for each crosslay. The strap shall be designed to loop through the nozzle handle and secured to the apparatus to keep nozzle from coming out of the crosslay compartment without manually disconnecting the nozzle strap.

07-56-1200

## **HINGED ALUMINUM TREADBRITE CROSSLAY COVER**

An aluminum treadbrite hinged cover shall be provided to cover the crosslay compartment. The cover shall have a full length polished stainless steel hinge. A chrome plated lift handle shall be provided on each end of the cover. Rubber protection blocks shall be provided in any area where the cover may come into contact with a painted surface.

The crosslay compartment shall be left open on each end.

09-00-6625

## **SIDE-MOUNTED SELF CONTAINED MODULAR PUMP COMPARTMENT**

A self contained modular pump compartment, designed for the integral mounting of a midship pump with side mounted pump operator's panel, shall be provided.

The modular design of the pump compartment shall allow the compartment to be fully independent of the apparatus body or cab. A minimum .75-inch gap shall be provided between the pump compartment and the apparatus body creating a flexible joint between the pump compartment assembly and the apparatus body.

10-90-2150

## **PUMP COMPARTMENT ACCESS PANELS**

Removable aluminum treadbrite access panels shall be provided on the front walls of the pump

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compartment on each side.

10-93-1910

## **SIDE MOUNT PUMP PANEL**

All controls and instruments shall be located on the left side of the apparatus. All discharge and intake valve controls shall be located on the left side pump panel.

## **BRUSHED STAINLESS STEEL PUMP PANELS**

The left and right side pump panels shall be constructed of 304 2B marine grade brushed stainless steel with a #4 brushed and polished finish.

10-96-0825

## **SIDE MOUNT PUMP PANEL LIGHTS - L.E.D.**

The side mount pump panel shall be illuminated using a 36" I.L.I. track type L.E.D. light assembly.

The light shall be constructed of an unbreakable type clear poly type flexible material housed in an aluminum extrusion mounted behind a brushed stainless steel light shield provided across the top of the gauge panel.

10-96-1995

## **INNOVATIVE CONTROLS PUSH/PULL VALVE CONTROL HANDLES**

For valve actuation, the apparatus pump panel shall be equipped with Innovative Controls side mount valve controls.

The ergonomically designed ¼ turn push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. The geared control rod, double-laminated locking clips, and rod housing shall be stainless steel and provide a true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel-mounting bezel and 4 mounting bolts.

10-96-3150

## **STAINLESS STEEL VALVE CONTROL LINKAGES**

All manual valve controls shall have control rod linkages constructed of 1/2" stainless steel rod or pipe and shall implement heavy ball swivel joints and clevises for smooth valve operation.

Plain, painted or coated control rods are not acceptable. (No Exception).

11-01-0125

## **MASTER PUMP DISCHARGE PRESSURE GAUGE - SPAN/THUEMLING**

A SPAN/THUEMLING model FA fire apparatus quality master pressure gauge shall be provided to indicate the main pump discharge pressure. The gauge shall read from 30" hg vacuum to 400 psi and

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shall be accurate within +/- 1%. The gauge shall be glycerin filled (-40F to +150F), read up to 400 psi, be accurate within +/- 1% and have a high impact resistant clear acrylic. The gauges shall be equipped a KEM-X freezeproof isolator protection.

11-01-0126

## **MASTER PUMP INTAKE PRESSURE GAUGE - SPAN/THUEMLING**

A SPAN/THUEMLING model FA fire apparatus quality master pressure gauge shall be provided to indicate the pump intake pressure. The gauge shall read from 30" hg vacuum to 400 psi and shall be accurate within +/- 1%. The gauge shall be glycerin filled (-40F to +150F), read up to 400 psi, be accurate within +/- 1% and have a high impact resistant clear acrylic. The gauges shall be equipped a KEM-X freezeproof isolator protection.

11-01-0134

## **3 1/2" DIAMETER MASTER/INTAKE/DISCHARGE GAUGES**

The master intake/discharge gauges shall have a 3 1/2" diameter dial.

11-01-0140

## **STAINLESS STEEL MASTER GAUGE BEZELS**

The master intake and discharge gauges shall have bright finish stainless steel bezels.

11-01-0145

## **MASTER INTAKE/DISCHARGE PRESSURE GAUGE DIALS - WHITE FACE**

The discharge pressure gauge dials shall be white with black markings. The needle shall match the color of the markings with a bright colored tip.

11-01-0160

## **MASTER INTAKE/DISCHARGE GAUGE LABELING**

The master intake gauge shall be clearly labeled "PUMP INTAKE" and shall be located to the left of the master discharge pressure gauge. (Burgundy label).

The master discharge gauge shall be clearly labeled "PUMP DISCHARGE" and shall be located to the right of the intake pressure gauge. (Black with silver lettering)

Due to the anticipated life expectancy of this unit, plastic labels will not be acceptable. .

11-01-0166

## **MASTER INTAKE.DISCHARGE GAUGE WARRANTY**

The master intake/discharge pressure gauges shall have a lifetime non-yellowing and freeze warranty.

The gauges shall also be warrantied for 4 years for defects in materials and workmanship,including fluid leakage. Warranty will not cover labor costs and/or transportation costs.

11-13-5015

## **FRC WL2000 "TANKVISION" TANK GAUGE**

A FRC model WL2000 tank gauge shall be provided on the pump panel. The gauge shall feature a 180

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degree highly visible wide view LED display showing the exact level of the booster tank. The gauge shall provide a flashing warning whe tank volume drops below 25% and down-chasing lights when tank is nearly or completely empty. The gauge shall implement a self-calibrating pressure sensor system to indicate the tank volume. A "probe" type of system shall not be used.

11-78-A202

## **DISCHARGE PRESSURE GAUGES - SPAN/THUEMLING**

Unless otherwise specified, each 1 1/2" or larger discharge shall have a SPAN/THUEMLING model FA fire apparaus quality pressure gauge. The guage shall be glycerin filled (-40F to +150F), read from 0 - 400 psi, be accurate within +/- 1% and have a high impact resistant clear acrylic. The gauges shall be equipped a KEM-X freezeproof isolator protection.

11-78-A400

## **2 1/2" DIAMETER DISCHARGE PRESSURE GAUGES**

The individual discharge pressure gauges shall have a 2 1/2" diameter dial.

11-78-A408

## **STAINLESS STEEL DISCHARGE PRESSURE GAUGE BEZELS**

The discharge pressure gauges shall have bright finish stainless steel bezels.

11-78-A415

## **DISCHARGE PRESSURE GAUGE DIALS - WHITE FACE**

The discharge pressure gauge dials shall be white with black markings. The needle shall match the color of the markings with a bright colored tip.

11-78-A450

## **DISCHARGE PRESSURE GAUGES/CONTROL HANDLE ALIGNMENT**

The pressure gauge shall be directly in line with the discharge control handle for the discharge that they provide pressure readout for.

For ease of operation, this requirement must be strictly adhered to. There shall be no exception to this requirement.

11-78-A455

## **DISCHARGE PRESSURE GAUGE LABELING**

The gauges shall be clearly labeled with permanent color coded labels.

11-78-A470

## **PRESSURE GAUGE WARRANTY**

The discharge pressure gauges shall have a lifetime non-yellowing and freeze warranty.

The gauge shall also be warrantied for 4 years for defects in materials and workmanship,including fluid leakage. Warranty will not cover labor costs and/or transportation costs.

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## 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 and shall be backed by a warranty equal to that of the exterior paint and finish. 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. These 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

14-06-2215

## 2,000 GALLON BOOSTER TANK

The tank shall have the capacity of 2,000 U.S. gallons and shall have a LIFETIME warranty provided by the manufacturer of the tank.

The tank shall be constructed of 1/2" thick polypropylene sheet stock. This material shall be non-corrosive stress relieved thermoplastic U.V. stabilized for maximum protection. The booster tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank is fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal.

The transverse swash partitions shall be manufactured of 3/8" polypropylene material. The longitudinal swash partitions shall be constructed of 3/8" 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 de-signed 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.

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene and shall be a minimum dimension of **10" x 10"** outer dimension. The tower shall be located in the left front corner of the hosebed. The tower shall have a 1/4" thick removable polypropylene screen and polypropylene hinged type cover. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank and shall be piped behind the rear wheels to maximize traction.

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

The sump shall be constructed of 1/2" polypropylene. The sump shall have a 3" NPT threaded outlet on the bottom for a drain plug. An anti-swirl plate shall be located approximately 2 1/2" above the sump.

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

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## **1 1/2" TANK SUMP DRAIN**

A 1 1/2" drain shall be provided in the bottom of the tank sump to fully drain the tank. The drain shall use 1 1/2" stainless steel piping with a 1 1/2" valve. The control for the valve shall be remoted to the drivers side of the apparatus just under and behind the side rubrail. The drain control handle shall be labeled "TANK DRAIN".

14-14-4940

## **REAR NEWTON 10" STAINLESS STEEL DUMP VALVE**

A Newton 10" stainless steel dump valve shall be provided on the rear of the apparatus.

An 18" stainless steel telescoping extension chute shall be provided and attached to the dump valve. The chute shall have a positive latching system to hold the chute in the "closed" position.

14-14-4950

## **DRIVER'S SIDE NEWTON 10" STAINLESS STEEL DUMP VALVE**

A Newton 10" stainless steel dump valve shall be provided on the left side behind the rear axle.

An 18" telescoping extension chute shall be provided and attached to the dump valve. The chute shall have a positive latching system to hold the chute in the "closed" position.

14-14-4955

## **PASSENGER'S SIDE NEWTON 10" STAINLESS STEEL DUMP VALVE**

A Newton 10" stainless steel dump valve shall be provided on the passenger's side of the apparatus behind the rear axle.

An 18" telescoping extension chute shall be provided and attached to the dump valve. The chute shall have a positive latching system to hold the chute in the "closed" position.

16-17-2054

## **2 1/2" RIGHT REAR TANK FILL**

One 2 1/2" rear tank fill shall be provided on the of the apparatus to the right of the rear dump valve. The fill valve shall be connected to the tank with 2-1/2" stainless steel threaded pipe, with the hose connection on the exterior of the apparatus supplied with a 2 1/2" FNST swivel connection, 30-degree elbow with a chrome plated plug and chain.

16-17-2900

A Hale Torrent stainless steel valve(s) shall be utilized on the tank fill(s).

16-20-0100

## **3" TANK TO PUMP**

A 3" tank to pump line shall be provided between the tank and the pump. The tank valve shall be a Hale Torrent stainless steel with control mounted on the pump operator's panel.

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The piping and valve arrangement shall be capable of flowing a minimum of 500 U.S. gallons per minute to the pump. This flow must be maintained for 80% of the certified tank capacity with the apparatus positioned on level ground.

An integral built in check assembly shall be provided on the pump. The check shall be designed to be an internal part of the pump thus allowing full opening and maximum flow to the pump. The check valve shall operate and 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.

28-00-0219

## **TANK CRADLE SUB-STRUCTURE - HOT DIPPED GLAVANIZED**

The tank cradle substructure shall be constructed of high strength structural steel. The tank cradle substructure shall be designed to provide support to the booster tank. The design of the cradle shall be approved by the tank manufacturer. Approval of the design shall be provided on request by the purchaser.

The entire tank cradle sub-structure 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 sub-structure, 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.

28-00-0230

## **REAR SUPPORT STRUCTURE - HOT DIPPED GALVANIZED**

The apparatus body substructure shall be constructed of high strength structural steel.

The substructure shall be designed to provide integral support of the apparatus body, rear step, and the tank mounting cradle system. The entire sub-frame shall be framed and jig welded together to insure a truly square sub-frame assembly. The substructure shall be fastened to the chassis rails so that the apparatus body may be easily removed from the chassis for repair, replacement, or mounting to a new chassis.

No holes shall be drilled into the top or bottom flange of the chassis frame rails. The substructure shall be designed to allow for a 22"-24" side running board/rear step height when the apparatus is on level ground. All fasteners used to secure the substructure to the chassis frame rails shall be hardened steel with locking type nuts.

After complete assembly of the tank cradle sub-structure, 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.

28-00-0500

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## 20 YEAR TANK CRADLE STRUCTURAL WARRANTY

The tank cradle shall have a 20 year structural warranty. NO EXCEPTIONS.

28-00-0505

## 20 YEAR TANK CRADLE CORROSION WARRANTY

The tank cradle shall have a warranty covering structural failure due to corrosion perforation. This warranty shall be in effect for 20 years after delivery of the apparatus to the customer. NO EXCEPTIONS

28-00-0510

## 20 YEAR REAR STRUCTURAL SUPPORT WARRANTY

The tank cradle shall have a warranty covering structural failure due to corrosion perforation. This warranty shall be in effect for 20 years after delivery of the apparatus to the customer. NO EXCEPTIONS

The rear structural support shall have a 20 year structural warranty. NO EXCEPTIONS.

28-00-0515

## 20 YEAR REAR STRUCTURAL SUPPORT CORROSION WARRANTY

The rear structural support shall have a warranty covering structural failure due to corrosion perforation. This warranty shall be in effect for 20 years after delivery of the apparatus to the customer. NO EXCEPTIONS

28-01-5030

## ALUMINUM APPARATUS BODY

The entire apparatus body shall be constructed of a combination of 5052 - H32 smooth aluminum sheeting with a minimum tensile strength of 33,000 PSI and a yield strength of 32,000 lbs, 6061-T6 extrusions with a minimum tensile strength of 45,000 PSI and a yield strength of 40,000 lbs., and 3003 - H22 aluminum tread plate with a minimum tensile strength of 30,000 PSI and a yield strength of 28,000 lbs. Any material that does not meet these minimum requirements shall not be used. All aluminum welding shall be Mig Spray Pulse Arc type to insure proper weld performance.

28-11-2605

## APPARATUS BODY CONSTRUCTION

The entire apparatus body shall be formed by shearing and bending the 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.

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28-11-2620

## **COMPARTMENT FLOORS**

All compartment floors shall be constructed of 1/8" 5052-H32 alloy aluminum sheeting with a minimum ultimate tensile strength of 32,000 psi. 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. A drainport shall be provided in each rear corner of the compartment to allow any water that may collect on the floor to drain out. 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 shall also include the rear face compartment. Any exception to this requirement will cause immediate rejection of bid.

28-11-2635

## **COMPARTMENT REAR WALLS/BODY SIDES**

The compartment rear walls and the apparatus body sides shall be constructed of 1/8" 5052-H32 alloy aluminum sheeting with a minimum tensile strength of 32,000 psi. All four outer corners, two front and two rear, shall be double bent to provide additional strength. 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.

28-11-2640

## **FRONT COMPARTMENT FACE OVERLAY**

The vertical surface of the front compartment face shall be overlaid with fire apparatus quality aluminum treadbrite. The overlay shall be one piece construction from top to bottom. 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 apparatus 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 to prevent dis-similar metal oxidation.

28-11-2650

## **SIDE/REAR COMPARTMENT TOPS AND CEILINGS**

The side and rear compartment tops and ceilings shall be constructed of 1/8" 5052-H32 alloy aluminum sheeting with a minimum tensile strength of 32,000 psi. The ceiling of the lower side compartments in the extended depth section shall also be constructed of this material.

28-11-2655

## **COMPARTMENT TOP OVERLAY**

The compartment tops shall be overlaid with fire apparatus quality aluminum treadbrite. The aluminum

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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 apparatus 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 to prevent dis-similar metal oxidation.

28-11-2660

## **FENDERWELLS**

The left and right side rear fenderwells shall be constructed of 3/16" aluminum sheeting with a minimum tensile strength of 32,000 psi. 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. Before the booster tank is installed, the fenderwells shall be thoroughly cleaned, all seams sealed, and automotive undercoated to prevent corrosion in the fenderwell area.

28-11-2663

## **REMOVABLE INNER FENDER LINER**

The fenderwells 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.

28-11-2665

## **STAINLESS STEEL FENDERETTE**

The fenderwells 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".

**The fenderette must be bolted into place and removable for replacement.**

28-12-2100

## **COMPARTMENT VENTILATION**

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

28-90-1100

## **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 an aluminum panel shall be Magna-Gard, or equal, coated to help prevent dissimilar 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. As dissimilar metal corrosion is a common occurrence on all apparatus and the Magna-Gard (or similar "baked on" finishes) coated fasteners are commercially available to all manufacturer's and is not a proprietary product, there shall be no exception to this requirement.

30-11-0215

## **DRIVER'S SIDE COMPARTMENT AHEAD OF REAR WHEELS**

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A compartment shall be provided ahead of the rear wheels on drivers side with a rollup door. The compartment shall be 36" high x 77" wide x 26" **usable depth.** The roll up door opening shall be 28" high x 74" wide.

The door exterior shall have a brushed satin finish.

30-14-0215

## **PASSENGER'S SIDE COMPARTMENT AHEAD OF REAR WHEELS**

A compartment shall be provided ahead of the rear wheels on passenger's side with a rollup door. The compartment shall be 36" high x 77" wide x 26" **usable depth.** The roll up door opening shall be 28" high x 74" wide.

The door exterior shall have a brushed satin finish.

49-90-0515

## **18" REAR TAILBOARD STEP**

An 18" depth rear tailboard step shall be provided on the apparatus. The step shall be spaced from the rear face of the apparatus body a minimum of 3/4" for easy wash out.

49-90-4000

## **REAR STEP MATERIAL - NFPA ALUMINUM TREADBRITE**

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

50-20-3045

## **HARD SUCTION MOUNTINGS**

Hard suction troughs shall be provided on the left side of the apparatus above the low side compartments. The hard suction shall be held in place with velcro straps. Two troughs shall be provided.

50-20-9100

## **4 1/2" x 10' HARD SUCTION HOSES (2)**

Two (2) sections of 4 1/2" diameter x 10' length clear lightweight PVC hard suction hose shall be provided, .

50-21-0750

## **HARD SUCTION HOSE COUPLINGS - NST**

The hard suction shall be coupled long handle female National Standard Thread x rocker lug male National Standard Thread.

50-21-0800

## **HARD SUCTION - KOCKEK**

The hard suction shall be Kockek brand.

50-29-3009

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## **FOLD DOWN PORTABLE TANK RACK - RIGHT SIDE**

A manual swing down hinged portable tank rack shall be provided and mounted on the right side of the apparatus above the low side compartments. The rack shall have an aluminum treadbrite housing on both ends with a minimum of 1 1/4" brushed stainless steel tubing connecting the two ends. The rack shall have two latches to hold the rack in the raised or travel position. The latches shall be located one on each end of the rack. Large rubber pads shall be provided and mounted on the aluminum treadbrite housings to keep the rack from contacting any painted surface of the apparatus body when the rack is lowered. The rack shall hinge down on heavy duty stainless steel hinges.

50-30-8300

## **SYNTEX 2100 PORTABLE TANK - ALUMINUM FRAME**

There shall be one (1) Syntex Industries model 2100 folding tank with aluminum square tube frame and 22 ounce vinyl coated nylon 2,100 gallon liner provided. A large, 10" diameter, folding discharge tube shall be provided for quick emptying. When set up, the tank shall measure 11'3" x 11'3" x 30" high.

50-30-9501

## **PORTABLE TANK LINER - RED**

The portable tank liner shall be red.

59-10-0218

## **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:

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

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## **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, the items 1-7 shall be deactivated. After deactivation, the battery system shall have ample reserve to start the engine.

## **ALTERNATOR PERFORMANCE TEST AT IDLE**

The second electrical test to be performed shall be **Alternator Performance Test at Full Load**. All electrical loads shall be activated with the engine running up to the governed rpm for two hours. During the test, the system voltage shall not drop below 11.7 volts or have excessive battery discharge for more than 120 seconds. Any loads not defined in the NFPA Minimum Electrical Load may be load managed to pass test.

## **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 shall not exceed 10%. All wiring shall be color, number, and function coded with the number and function being printed every three inches 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.

A removable bulkhead shall that extends from the floor to the ceiling of both side rear compartments shall be provided to protect rear wiring.

59-20-0100

## **MASTER BATTERY DISCONNECT**

A Cole Hersee model 2484-16 master battery disconnect switch shall be provided, mounted within easy reach of the driver when seated. The switch shall be wired between the starter solenoid and the remainder of the electrical loads on the apparatus. The batteries shall be connected directly to the starter

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

A green 'battery on' indicator light shall be provided in clear view of the driver. The light shall be mounted in a manner that will not impair the drivers vision or reflect onto the windshield.

59-21-0101

## **LICENSE PLATE LIGHT/BRACKET**

An Arrow model 437-00-332 chrome plated license plate light shall be provided on the rear of the apparatus. The light shall function with the head light switch.

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

59-22-1000

## **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.

59-22-3000

## **MID-MOUNTED SIDE TURN SIGNAL - L.E.D.**

A mid-mounted amber LED side turn signal shall be provided in the mid section area of the apparatus on both sides. The low profile signal shall be recessed into the side rubrail for protection.

59-23-0100

## **PUMP COMPARTMENT LIGHTS (2)**

Two Weldon 2025 compartment lights shall be provided to illuminate the interior of the pump compartment. The lights shall function with the pump operators gauge panel lights.

59-23-5000

## **ENGINE COMPARTMENT LIGHT**

A Weldon model 2025 light shall be provided and mounted over the engine on the engine compartment wall. An on/off switch shall be provided on the light to activate it.

60-01-1425

## **ILI - LED COMPARTMENT LIGHTING**

Each apparatus body compartment shall have one ILI track type L.E.D. light 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 have a 48" long light section and a 'low height' or above wheel compartment shall have a 18" long section.

The lights shall function automatically and independently of other compartments when the compartment

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door is opened. **Compartment lighting systems that are controlled by a single, dash mounted switch are not acceptable.**

60-01-1500

## **COMPARTMENT LIGHT SWITCHES**

Each hinged apparatus body door compartment shall have a magnetic style reed indicator switch. Each switch shall be hermetically sealed rated to 10,000,000 cycles. The reed shall be potted in the contact housing with polyurethane and the housings shall be molded fire retardant ABS plastic. The contact and magnetic housing shall snap-lock in the body material, one on the body and one in the door.

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.

60-01-2100

## **DOOR AJAR INDICATOR - L.E.D.**

A 1" X 2" RED LED flashing light shall be provided in the cab in clear view of the driver to warn of an open compartment or personnel door.

60-01-5000

## **PERIMETER/STEP LIGHTS**

There shall be five Truck-Lite model 40 underbody perimeter lights furnished and installed. The lights shall be shock mounted and have an unbreakable polycarbonate lens and housing. The light shall be sealed to help prevent moisture from entering the light. The lights shall be located one under each side of the front of the body, one each side under the chassis cab steps and one under the rear step to illuminate the ground around the truck. The ground lights shall be activated with the parking brake.

All runningboards, walkways and steps shall be properly illuminated to NFPA standards.

60-02-9900

## **12 VOLT POLARIZED BATTERY CHARGING RECEPTACLE - OFF-BOARD BATTERY CHARGER**

A model 2607MB single 12 volt polarized recessed male receptacle shall be provided and located just below the drivers door. The receptacle shall be wired to the battery system to allow charging of the apparatus batteries by an off board (not on apparatus) battery charger.

A model 27T07 mating female cord end shall be shipped loose with the apparatus to allow the Fire Department to connect cord end to Fire Department provided charging cord.

60-10-1901

## **WHELEN TRI-CLUSTER TAILLIGHTS - L.E.D. - INCANDESCENT**

Whelen 60R00BRR 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.

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60-15-0100

## **BACKUP ALARM**

A Code 3 (or equal) model DAP50 97db backup alarm shall be provided and shall automatically activate when the apparatus transmission is placed into reverse.

The backup alarm shall exceed all NFPA1901 and SAE J994 Type D requirements and testing.

64-80-0500

## **CENTER CONSOLE MOUNTED SWITCH PANEL FOR COMMERCIAL CHASSIS**

A center control console shall be provided between the drivers and officers seats for all warning light switching, scenelighting switches, step light switches, pump shift, and battery switch.

The console shall be constructed of aluminum treadbrite with a brushed stainless steel top switch panel. A storage pocket shall be provided on the rear of the console for storing books, maps, etc.

A single Master Optical Warning Device switch shall be provided that will activate all Minimum Optical Warning Lighting through a **single** switch. Individual switches shall not be provided for any Minimum Optical Warning Lighting to insure total compliance to the warning lighting requirements defined in NFPA 1901. All lighting controlled by this switch shall not be subject to load management.

Any warning lights that are installed on the apparatus that are not required to meet the Minimum Optical Warning Lighting shall be subjected to load management and shall have individual switches to activate/de-activate the warning light.

All switches shall be clearly labeled as to their function.

65-03-7110

## **ZONE A UPPER WARNING LIGHTING**

A Code 3 model 2158NFPA2 LED lightbar shall be mounted on the top of the cab roof. The lightbar shall be 58" in length and mounted with low profile stainless steel brackets.

The lightbar shall be divided into four sections:

The center two sections shall each have a red LED OPTIX lighthouse.

The outer sections shall each have five red LED lighthouses. Three shall be LED-X and two shall be OPTIX lighthouses.

65-30-0100

## **ZONES C, B, & D UPPER WARNING LIGHTING**

### Zone C Rear Upper Lighting

Two Code 3 model 550 (B1276) rotating beacons with 50 watt fast rotators, one each side. The Drivers side lens shall be amber and the Officers side shall be red.

### Zone B Right Side Upper Lighting

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This area shall be covered by the outboard rotator of the lightbar in Zone A upper lighting and the 550 beacon in Zone C rear upper lighting.

## Zone D Left Side Upper Lighting

This area shall be covered by the outboard rotator of the lightbar in Zone A upper lighting and the 550 beacon in Zone C rear upper lighting.

65-65-4000

## **ZONE A LOWER WARNING LIGHTING - FRONT**

Two Code 3 model LXEX1F-R red L.E.D.'s shall be mounted on the lower front area of the apparatus, one each side. An aluminum bezel shall be provided around the lights.

65-71-8200

## **ZONES B & D LOWER WARNING LIGHTING - SIDES**

### Zone B Right Side Lower Lighting

Three Code 3 model OPTIX-3 red LED lights shall be provided on the right side. An aluminum bezel shall be provided around the lights. One red light shall be mounted as low and as far for-ward on the apparatus cab as possible and one red light shall be mounted as low and as far rear-ward as possible on the apparatus body. The thirs shall be mid mounted.

### Zone D Left Side Lower Lighting

Three Code 3 model OPTIX-3 red LED lights shall be provided on the left side. An aluminum bezel shall be provided around the lights. One red light shall be mounted as low and as far for-ward on the apparatus cab as possible and one red light shall be mounted as low and as far rear-ward as possible on the apparatus body. The third shall be mid mounted.

65-77-7500

## **ZONE C LOWER WARNING LIGHTING - REAR**

Two Code 3 model LXEX1F-R red L.E.D.'s shall be mounted on the lower rear area of the appa-ratus, one each side. An aluminum bezel shall be provided around the lights.

68-01-0195

## **CODE 3 V-CON 3672 SIREN**

A Code 3 model 3672 V-Con siren shall be provided and mounted in the cab.

The siren shall have wail, yelp, hyper-yelp, and air horn tones as well as public address (PA) and shall be capable of radio rebroadcast. A hard-wired microphone shall be provided.

69-01-1000

## **100 WATT SPEAKER**

A 100 watt speaker shall be provided and recessed into the front bumper. The model of speak-er

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installed shall be designed to fit bumper type.

74-01-0120

## **CODE 3 41Z26 SCENELIGHTS**

Six Code 3 model 41Z26 7" x 3" 26 degree scenelights shall be provided and mounted two on each side and two on the rear. The lights shall have a chrome plate trim bezel.

74-09-5000

## **12 VOLT SCENELIGHT ACTIVATION SWITCH (1)**

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

74-20-0400

## **DUAL FUNCTION REAR SCENELIGHT(S)**

The rear facing scenelight(s) shall activate automatically when the apparatus transmission is placed into reverse.

90-00-0026

## **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:

1. Engine Oil.
2. Engine Coolant.
3. Transmission Fluid.
4. Pump Transmission Fluid.
5. Pump Primer Fluid (if applicable).
6. Drive Axle Fluid.
7. Air Conditioning Refrigerant.
8. Air Conditioning Lubrication Oil.
9. Power Steering Fluid.
10. Cab Tilt Mechanism Fluid (if applicable).
11. Transfer Case Fluid.
12. Equipment Rack Fluid (if applicable).
13. Air Compressor System Lubricant.
14. Generator System Lubricant.
15. Front tire cold pressure.
16. Rear tire cold pressure.
17. Maximum tire speed ratings.

90-00-0030

## **OCCUPANCY LABEL**

A permanent plate or label stating the maximum number of personnel allowed to ride on the apparatus at any one time, shall be provided and installed in clear view of the driver

90-00-0035

## **SEATED AND BELTED LABEL**

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Permanent plate or label shall be provided stating "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" and visible from each seated position.

90-00-0040

## **DO NOT RIDE LABEL**

A permanent plate or label shall be attached to the appropriate areas of the apparatus stating that riding on the rear step or any exterior position on the apparatus is prohibited.

90-00-0051

## **DO NOT WEAR HELMET LABEL**

Permanent plate or label shall be provided stating "DO NOT WEAR HELMET WHILE SEATED" and visible from each seated position.

90-00-0060

## **MAXIMUM TIRE SPEED LABEL**

A permanent plate or label shall be provided in the cab stating the maximum tire speed rating.

90-00-0075

## **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.

90-02-2225

## **MANUFACTURER'S RECORD CERTIFICATION**

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

1. The manufacturers record of apparatus construction details, including the following information:
  - a. Owners name and address
  - b. Apparatus manufacturer, model, and serial number
  - c. Chassis make, model, and serial number
  - d. GAWR of front and rear axles
  - e. Front tire size and total rated capacity in pounds (kg)
  - f. Rear tire size and total rated capacity in pounds (kg)
  - g. Chassis weight distribution in pounds with water and manufacturer mounted equipment (front and rear)
  - h. Engine make, model, serial number, rated horsepower and related speed, and governed speed
  - i. Type of fuel and fuel tank capacity
  - j. Electrical system voltage and alternator output in amps
  - k. Battery make, model, and capacity in cold cranking amps (CCA)

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- l. Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
  - m. Ratios of all driving axles
  - n. Maximum governed road speed
  - o. Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - p. Pump transmission make, model, serial number, and gear ratio
  - q. Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - r. Water tank certified capacity in gallons or liters (if applicable).
  - s. Aerial device type, rated in vertical height in feet, rated horizontal height in feet, and rated capacity in pounds.
  - t. Paint manufacturer and paint number(s)
  - u. Company name and signature of responsible company representative
2. Certification of slip resistance of all stepping, standing, and walking surfaces
  3. If the apparatus has a fire pump, a copy of the pump manufacturers certification of suction capability.
  4. If the apparatus has a pump, a copy of the apparatus manufacturers approval for stationary pumping applications.
  5. If the apparatus has a pump, a copy of the engine manufacturers certified brake horsepower curve showing the maximum governed speed.
  6. If the apparatus has a pump, a copy of the pump manufacturers certification of the hydrostatic test.
  7. If the apparatus has a pump, a copy of the certification of inspection and test for the fire pump.
  8. If the apparatus has an aerial device, the certification of inspection and test for the aerial device.
  9. If the apparatus has an aerial device, all technical information required for inspections to comply with NFPA 1914.
  10. If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source
  11. If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation
  12. Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
  13. Written load analysis and results of the electrical system performance tests
  14. When the apparatus is equipped with a water tank, the certification of water tank capacity

90-02-2405

## **VEHICLE ROLLOVER STABILITY**

The apparatus shall be certified to NFPA 1901 Rollover Stability requirements using the calculated/measured center of gravity method.

90-02-3005

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

The apparatus shall be equipped with an on-board Vehicle Data Recorder ( VDR) . The recorder shall be capable of recording the following data, in this order, at a minimum of once per second:

- Vehicle speed (MPH).

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- Acceleration ( from speedometer) (MPH/Sec)
- Deceleration (from speedometer) (MPH/Sec)
- Engine speed (RPM)
- Engine throttle position (% of throttle)
- ABS event ( on/off)
- Seat occupied status (occupied yes/no by position)
- Seat belt status (buckled yes/no by position)
- Master optical warning device switch (on/off)
- Time (24 hour)
- Date (year/month/day)

The data shall be stored at the sampling rate in a 48 hour loop. The system shall have sufficient memory to record 100 engine hours with of minute by minute summary data showing the data listed above. When the memory capacity is reached, the system shall erase the oldest data first..

All data stored in the VDR shall be password protected, uploadable by the user to a computer and importable to into a data management software package. that shall be provided with the apparatus. The software shall be both "Windows" and "Apple" compatible. The software shall produce the following formatted reports from the uploaded data:

- Daily log for the time the engine is runningfor a given date ( minute by minuteoutput of all values.
- Weekly summary (maximum values each hour for each day of the week).
- Monthly summary (maximum values each day for each day of the month)

90-02-3015

## **SEATBELT WARNING SYSTEM**

The apparatus shall be equipped with a seatbelt warning system. The system shall consist of an audible warning device that can be heard at all seating positions that are designed to be occupied while the vehicle is in motion as well as a visual display visable to the driver showing each seating position. The warning system shall be activated anytime the parking brake is released or the automatic transmission is not in park

The system shall display seating position lights as follows:

- Green (buckled/senses occupant)
- Red (buckled/no occupant)
- Red (unbuckled/senses occupant)
- Dark (unbuckled/no occupant)

90-02-3025

## **OCCUPIED SEATING POSITIONS -(2)**

There shall be two seating postions designated for use while the vehicle is in motion.

90-02-3210

## **FIRE HELMET MOUNTINGS**

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

91-00-0050

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## **PAINT PROCEDURE - PPG DELFLEET**

The exterior sides, front and rear of the tank shall be finished coated using PPG Delfleet paint.

91-00-0500

## **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 removable parts shall be fully disassembled for the paint process. The apparatus body shall not be mounted on the chassis during the paint process.

All seams or flanges on the apparatus body shall be properly sealed to prevent moisture accumulation in flanged areas.

### **PAINT PROCESS:**

The apparatus body paint procedure shall consist of an eight (8) step finishing process as follows:

1. Manual Surface Preparation: All exposed metal surfaces on the apparatus exterior shall be thoroughly cleaned as per SSPC-SP1. All imperfections on the exterior metal surface shall be removed or filled prior to the priming process. All exposed metal shall be thoroughly abraded using a dual orbital air power sander as per SSPC-SP3.
2. Cleaning and Treatment: All surfaces shall be chemically cleaned using PPG DX436 was and grease remover cleaning agent to remove all dirt. Oil,grease and metal oxides to ensure proper adhesion as per SSPC-SP1.
3. Self-etching Primer Application: PPG Delfleet F3960 two component acid etching primer shall be applied to the bare metal as per bulletin DFT-041.
4. Primer/Surfacer Application: PPG K36 two component urethane primer/surfacer shall be applied to the acid etching primer.
5. Dual Orbital Sanding: The primer/surfacer shall be thoroughly sanded to a superior smooth surface.
6. Cleaning: After sanding in step #5, all surfaces shall be chemically cleaned again using PPG DX436 was and grease remover to remove all oil and dirt. The surface to be painted shall be clean of all oil, grease, and dirt to ensure proper adhesion as per SSPC-SP1.
7. Primer Sealer Application: PPG Delfleet F3975 two component urethane primer/sealer shall be applied over the thoroughly sanded and cleaned primer/surfacer as per bulletin DFT-054.
8. Topcoat Application: Two coats of PPG Delfleet FBCH basecoat color two component polyurethane paint shall be applied to the primer sealer as per bulletin DFT-001. The base color shall be followed by two coats of PPG Delfleet F3905 two component polyurethane clearcoat finish as per bulletin DFT-055.

### **DRY FILM TESTS**

The apparatus manufacturer shall perform dry film readings on the painted apparatus to insure adequate

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paint thickness. The total dry film readings shall be a minimum of 6.4 mils average. These readings must be measured with an ETG ferrous/nonferrous digital dry film thickness measurement instrument. Readings must be taken from a minimum of 12 separate locations on the apparatus body. The apparatus manufacturer must record these tests and make them available to the purchaser upon request.

## **PAINT PROCESS SYSTEM AUDIT**

The apparatus manufacturer shall strictly follow the documented paint application procedure as provided by the paint manufacturer. The paint manufacturer shall also perform an annual audit of the paint process.

91-00-0700

### **PPG CERTIFIED 10 YEAR PAINT WARRANTY**

The apparatus body exterior finish paint shall have a 10 year warranty per the terms and conditions of the PPG written warranty. The warranty shall be certified by the manufacturer of the paint. Documentation of this shall be provided. Any warranty that is extended by the apparatus manufacturer and not backed by the paint manufacturer will not be acceptable.

91-00-0800

### **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 prevent electrolysis and corrosion between dissimilar metals. This shall be in addition to any other barrier material that may be used.

91-00-8200

### **APPARATUS BODY COMPARTMENT INTERIOR FINISH**

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

91-01-7002

### **TIRE PRESSURE VISUAL INDICATOR**

Valve stem mounted visual indicators shall be provided on each tire. The indicators shall identify the following conditions:

ALL GREEN. - Tire is properly inflated.

HALF GREEN/HALF RED - Tire is approximately 10% under inflated

ALL RED - Tire is 20% or more under inflated.

91-04-0200

### **6" NFPA REFLECTIVE STRIPE**

A 6" 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, 50% across the rear and 25% across the front of the apparatus. The stripe shall comply to NFPA 1901 requirements.

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## **PRIMARY REFLECTIVE STRIPE COLOR - WHITE**

The primary reflective stripe shall be 680-10 white.

91-04-9500

## **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.

91-05-6100

## **INNER CAB DOOR REFLECTIVE STRIPING - 2 DOOR**

A minimum of 100 square inches of reflective material shall be provided on the inner door liner of each cab door.

91-11-1625

## **REAR CHEVRON STRIPING - DIAMOND GRADE**

A minimum of 50 percent of the rear vertical surface of the apparatus shall be covered with 6 inch alternating 983-71 red and 983-23 fluorescent yellow green "Diamond grade" retroreflective striping. The striping shall slop downward away from the centerline of the apparatus at a 45 degree angle.

The retroreflective material shall conform to the requirements of ASTM D 4956 "Standard Specification for Retroreflective Sheeting for Traffic Control", Type I or better.

94-75-4600

## **ENGINE EXHAUST**

The exhaust pipe from the engine shall be ahead of the rear wheels. A shield 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 by the chassis manufacturer to comply with EPA equipment requirements.

95-01-0100

## **FRONT/REAR MUDFLAPS**

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

95-01-3000

## **FRONT/REAR AXLE NUT COVERS AND BABY MOONS**

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

95-03-0200

## **FRAMERAIL TOW EYES**

Two 3/4" plate steel tow eyes shall be attached direct to the end of the framerails on the rear of the

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apparatus. The eyes shall have a minimum of a 3" diameter pass through. Each eye shall be attached to the framerail with a minimum of four 3/4" hardened steel bolts with locking nuts.

99-90-0100

## **"AS BUILT" APPARATUS BODY OWNERS MANUAL CD ( 2)**

Two "as built" apparatus body owners manual CD's ( compact disc ) 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 CD. The CD's shall be "read only" and shall not allow modification.

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

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