

Toyne Inc.

02-01-0300

HALE MODEL Q-FLO 1,250 GPM SINGLE STAGE PUMP

The fire pump shall be a Hale Fire Pump Company model Q-FLO that complies with all applicable requirements of the latest edition of the NFPA #1901, " Standard for Automotive Fire apparatus " published by the National Fire Protection Association.

02-94-5100

UNDERWRITER'S LABORATORY CERTIFICATION

The completed apparatus shall be tested and approved by the independent testing company Underwriters 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.

02-95-0700

PUMP PERFORMANCE - 1,250 U.S. GPM.

The pump shall be a single stage centrifugal with a class "A" rated capacity of 1,250 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.

02-96-0500

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, 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 to 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

10622-0005

12/30/08

Toyne Inc.

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.

GEARBOX

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.

02-96-8100

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.

04-03-0815

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.

10622-0005

Toyne Inc.

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

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.

04-12-0400

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 operator to manually lift up on the switch lever to disengage the lock.

The switch shall have three positions. Position 1 shall be road position, position 2 shall be a neutral position and position 3 shall be 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

10622-0005

12/30/08

Toyne Inc.

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.

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.

04-12-6200

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.

04-91-0300

10622-0005

12/30/08

Toyne Inc.

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

04-91-1000

LEFT SIDE INTAKE STEAMER TYPE - NO VALVE

The left side master intake shall be steamer type and shall not have any type of valve.

04-95-0300

LEFT SIDE MASTER INTAKE CAP

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

05-02-0300

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 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.

05-02-1000

RIGHT SIDE INTAKE STEAMER TYPE - NO VALVE

The right side master intake shall be steamer type and shall not have any type of valve.

05-07-7800

RIGHT SIDE MASTER INTAKE CAP

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

05-60-1910

3/8" PUMP COOLING/BYPASS LINE

A 3/8" pump cooling/bypass line shall be provided from the pump discharge manifold directly into the tank.

This discharge shall implement a Class 1 model 38BV all brass ball type 1/4 turn valve with chrome plated handle control located on the pump panel.

The valve control handle shall be indicate the open/closed position of the valve. The handle shall have a recessed area for mounting of the identification label which shall clearly state "PUMP COOLER".

05-90-0200

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

10622-0005

Toyne Inc.

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 from the pump operator's position.

06-02-0500

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.

06-02-2000

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.

06-04-0100

2-1/2" RIGHT SIDE AUXILIARY INTAKE

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

06-04-2000

A Hale Torrent stainless steel suction valve(s) shall be utilized on the right 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.

06-04-8000

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

10622-0005

12/30/08

Toyne Inc.

06-48-0100

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.

06-48-3000

FOAM CAPABLE DICHARGES

The following discharges shall be foam capable:

The two 1 3/4" crosslays and the Right rear 2 1/2" discharge shall be foam capable.

06-48-3500

CLASS A "LOW FOAM IN TANK" SWITCH

There shall be a Foam Pro model 2510-0032 low tank level switch provided and vertically mounted in the wall of the foam tank. This switch shall provide "low foam concentrate" indication to the pump operator.

06-48-3800

FOAM SYSTEM SCHEMATIC PLACARD FOR SINGLE TANK SYSTEM

10622-0005

12/30/08

Toyne Inc.

There shall be a Foam Pro part number 6032-0015 foam system layout placard provided and located in close proximity to the pump operator's position as required by NFPA 1901.

06-48-4000

FOAM SYSTEM RATING PLACARD FOR FOAM PRO 1600 SYSTEM

There shall be a Foam Pro part number 6032-0018 foam system rating placard provided in close proximity to the pump operator's position as required by NFPA 1901.

07-01-0100

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.

07-03-0100

RIGHT 3" DISCHARGE(S)

One (1) 3" discharge shall be provided on the right side of the apparatus.

07-03-3200

A Hale Torrent stainless steel discharge valve(s) shall be utilized on the right side 3" discharge(s). The valve shall be manually controlled from the pump operator's position. A slowclosing mechanism shall be implemented in the control mechanism.

07-03-8100

The right side 3" discharge(s) shall extend straight out of the apparatus with no type of elbow.

07-04-2500

A Kochek model 201-052 3" FNST x 5" locking Storz x 2 1/2" MNST elbow adapter shall be provided on the right side 3" discharge(s) with a 2 1/2" cap and chain.

07-11-0100

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.

10622-0005

12/30/08

Toyne Inc.

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.

07-21-0100

RIGHT REAR 2 1/2" DISCHARGE

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

07-21-3200

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

07-21-8000

The right rear 2 1/2" discharge(s) shall have chrome discharge elbow(s).

07-22-1000

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

07-31-0100

LEFT REAR 2 1/2" DISCHARGE

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

07-31-3200

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

07-31-8000

The left rear 2 1/2" discharge(s) shall have chrome discharge elbow(s).

07-32-1000

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

07-52-5500

1 3/4" CROSSLAY PRECONNECTS

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

Each crosslay shall have the minimum capacity of 200 feet of 1 3/4" double jacketed fire hose and nozzle.

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 side mount pump operators panel.

10622-0005

12/30/08

Toyne Inc.

2 1/2" CROSSLAY PRECONNECT

One 2 1/2" preconnected crosslays shall be provided and located above the side mount pump panel.

Each crosslay shall have the minimum capacity of 200 feet of 2 1/2" double jacketed fire hose and nozzle.

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 1/2" piping or high pressure hose incorporating a 2 1/2" ball valve with the control on the side mount pump operators panel.

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".

07-54-3200

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

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.

07-55-1000

There shall be one (1) 2 1/2" swivel elbow with a 2-1/2" Male NST hose thread connection provided on the 2-1/2" cross lay hose bed. The swivel shall be mounted in a position to prevent hose "pinching" at the hose thread connection.

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 crossaly 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.

07-60-0100

3" MONITOR DISCHARGE-CENTER

10622-0005

12/30/08

Toyne Inc.

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

07-60-4100

A Hale Torrent stainless steel discharge valve(s) shall be utilized on the monitor discharge(s). The valve shall be manually controlled from the pump operator's position. A slow closing mechanism shall be implemented in the control mechanism.

07-62-0000

CAPPED MONITOR DISCHARGE

The monitor discharge shall be capped with a female National Pipe Thread cap for future installation of monitor assembly.

09-00-2500

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. An extruded rubber gasket shall be installed in the gap to help prevent entry of road debris, snow, ice, etc., into the pump compartment. The modular design of the pump compartment shall allow the entire pump system, including the pump itself, to be removed from the apparatus in a one-piece, modular section, while leaving the body intact and without having to cut any sheet metal or welds.

09-18-0500

HYPER-FLEX PUMP MOUNTING

The independent pump module assembly shall be mounted to the chassis frame rails with "Hyper-Flex" vibration and shock isolators using a four (4) point mounting system. Flexible neoprene pads, especially engineered for the expected weight and torsional flexing of the pump module, shall be incorporated into the system to eliminate chassis framerail flexing from transmitting harmful loads and twisting into the pump module.

09-18-0500

HYPER-FLEX PUMP MOUNTING

The independent pump module assembly shall be mounted to the chassis frame rails with "Hyper-Flex" vibration and shock isolators using a four (4) point mounting system. Flexible neoprene pads, especially engineered for the expected weight and torsional flexing of the pump module, shall be incorporated into the system to eliminate chassis framerail flexing from transmitting harmful loads and twisting into the pump module.

09-18-3000

STAINLESS STEEL PUMP COMPARTMENT CONSTRUCTION

The entire pump compartment shall be constructed using only 304 marine grade stainless steel fabricated sheeting with a #4 annealed and polished finish on all exterior surfaces. The pump compartment shall not require any finish painting. Due to the extreme twisting and flexing that all fire apparatus are subjected to, aluminum shall not be used in any portion of the pump compartment structural support. The use of any

10622-0005

12/30/08

Toyne Inc.

type of enclosed tubing that requires the use of self tapping or any other type of machine screw shall not be acceptable.

09-21-4000

PUMP COMPARTMENT RUNNINGBOARDS

The pump compartment side runningboards shall be constructed of NFPA compliant, slip resistant aluminum treadbrite on stepping surfaces.

10-90-2100

PUMP COMPARTMENT RIGHT SIDE ACCESS DOOR - SIDE MOUNT

A brushed stainless steel hinged access door shall be provided on the right side of the pump compartment. The doors shall have pneumatic hold open devices and push button type flush latches. The door shall be a minimum of 35" wide x 20" high.

10-93-2000

SIDE MOUNT BRUSHED STAINLESS STEEL 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. The panels shall be held into place with two latches on the top to allow for easy removal of the panels.

The upper section of the left side pump panel shall be constructed of the same 304 2B marine grade stainless steel. The upper section shall be vertically hinged and have a chrome plated latch to secure the panel when closed.

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.

10-96-0830

RIGHT SIDE DISCHARGE/INTAKE PANEL LIGHTS - L.E.D.

The right side discharge and intake panels shall be illuminated using a 24" 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 hinged access door.

10-96-2000

10622-0005

12/30/08

Toyne Inc.

PUSH/PULL VALVE CONTROL HANDLES

All valve control handles shall be Class One model 100348 push/pull type "T" handles. The "T" handles shall be chrome plated zinc and shall have a 1" x 3" recessed area for the color coded identification label. The panel mounting plate shall be chrome plated and shall be secured to the panel using four stainless steel bolts with locking type fasteners. The control rod shall be 3/4" hard coated anodized aluminum with a universal ball swivel connection. The control rod shall have a self-aligning handle to insure smooth push/pull activation.

10-96-2040

DISCHARGE VALVE CONTROL HANDLE LAYOUT

All discharge valve control handles shall be located in a horizontal line across the mid section of the pump panel. All discharge valve control handles shall be located immediately below their corresponding pressure gauge for ease of pump operation.

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).

11-01-0121

MASTER PUMP DISCHARGE PRESSURE GAUGE - SPAN/THUEMLING

A SPAN/THUEMLING model FA fire apparatus quality pressure gauge shall be provided to indicate the main pump discharge pressure. The gauge shall be glycerin filled (-40F to +150F), read from 30"-0-600 psi, be accurate within +/- 1% and have a high impact resistant clear acrylic. The gauges shall be equipped a KEM-X freezeproof isolator protection. The gauge shall read from 30" hg vacuum to 600-PSI and shall be accurate within +/- 1%.

11-01-0122

MASTER PUMP INTAKE PRESSURE GAUGE - SPAN/THUEMLING

A SPAN/THUEMLING model FA fire apparatus quality pressure gauge shall be provided to indicate the main pump intake pressure. The gauge shall be glycerin filled (-40F to +150F), read from 30"-0-600 psi, be accurate within +/- 1% and have a high impact resistant clear acrylic. The gauges shall be equipped a KEM-X freezeproof isolator protection. The gauge shall read from 30" hg vacuum to 600-PSI and shall be accurate within +/- 1%.

11-01-0130

4 1/2" DIAMETER MASTER/INTAKE/DISCHARGE GAUGES

The master intake/discharge gauges shall have a 4 1/2" diameter dial.

11-01-0141

COLOR CODED MASTER GAUGE BEZELS

The master discharge pressure gauge have a bright finish stainless steel bezel and the master intake gauge shall have a color coded bezel (burgundy)

10622-0005

12/30/08

Toyne Inc.

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 3 years for defects in materials and workmanship,including fluid leakage. Warranty will not cover labor costs and/or transportation costs.

11-09-3500

PRESSURE/VACUUM TEST PLUGS

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

11-13-5000

FRC WL2000 "TANKVISION" TANK GAUGE

A FRC model WL2000 tank gauge shall be provided on the pump panel. The gauge shall feature a 180 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-A200

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 - 600 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.

10622-0005

12/30/08

Toyne Inc.

11-78-A409

COLOR CODED DISCHARGE PRESSURE GAUGE BEZELS

The discharge pressure gauges shall have color coded bezels matching their identification labels.

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 metal color coded labels.

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

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 3 years for defects in materials and workmanship, including fluid leakage. Warranty will not cover labor costs and/or transportation costs.

11-80-2500

METAL IDENTIFICATION TAGS FOR PUMP PANEL

Permanently engraved metal identification tags will be used to label all controls, inlets, outlets, drains, etc., on the apparatus pump system. The use of plastic tags shall not be acceptable. The tags shall be attached to the apparatus using very high bond (VHB) double sided automotive adhesive tape. To help prevent dis-similar metal corrosion, the use of metal fasteners shall not be acceptable. All discharge and intake identification labels shall be color coded to NFPA 1901 recommendations with labels at the control, intake/discharge location and drain port location.

13-00-1405

BOOSTER TANK- UNITED PLASTIC FABRICATING, INC.

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

The tank shall be constructed of 1/2" thick PT2E polypropylene sheet stock. This material shall be non-

10622-0005

12/30/08

Toyne Inc.

corrosive stress relieved thermo-plastic, natural in color and 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" PT2E polypropylene material. The longitudinal swash partitions shall be constructed of 3/8" PT2E 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.

The tank cover shall be constructed of 1/2" thick PT2E polypropylene, natural in color, 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" PT2E 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.

14-00-3200

BOOSTER TANK CAPACITY 1,000 GALLONS

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

14-08-2301

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 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 remov-able polypropylene screen and polypropylene hinged type cover.

14-08-2500

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 that is designed to run through the tank and shall be piped behind the rear wheels to maximize traction.

14-08-4000

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 drivers side of the

10622-0005

12/30/08

Toyne Inc.

apparatus just under and behind the side rubrail. The drain control handle shall be labeled "TANK DRAIN".

14-10-0100

20 GALLON CLASS A FOAM TANK

A 20 gallon Class A foam tank shall be provided and shall be an integral part of the main booster tank. 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 a **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".

16-17-2000

2 1/2" REAR TANK FILL(S)

one (1) 2 1/2" rear tank fills shall be provided on the rear of the apparatus. The fill connection shall be located on the right side of the rear face. The valve shall be located on the inside of the rear compartment with the valve control and connection located on the exterior. 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 shall be utilized on the rear tank fill.

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 an Hale Torrent stainless steel with control mounted on the pump operator's panel.

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.

28-00-0225

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.

10622-0005

Toyne Inc.

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

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

10622-0005

12/30/08

Toyne Inc.

EXCEPTIONS

28-00-1000

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 framerail flexing from transmitting harmful loads and twisting into the body.

28-02-5000

100" BODY WIDTH

The apparatus body shall be 100" wide from side to side measuring from the rub rail mounting surface.

28-11-2005

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.

28-11-2015

3/16" COMPARTMENT FLOORS

All compartment floors shall be constructed of 3/16" aluminum sheeting with a minimum ultimate tensile strength of 32,000 psi. 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.

28-11-2025

COMPARTMENT REAR WALLS/BODY SIDES

The compartment rear walls and the apparatus body sides (forming the inner walls of the hosebed, shall be constructed of 3/16" aluminum sheeting with a minimum tensile strength of 32,000 psi.

28-11-2100

FENDERWELLS - FINISH PAINTED

10622-0005

12/30/08

Toyne Inc.

The left and right side rear fender wells shall be constructed of 3/16" smooth aluminum with a minimum tensile strength of 30,000 PSI. The rear fender well assembly shall be finish painted to match the primary exterior color of the apparatus. **Aluminum treadbrite, polished stainless steel or bolted on painted overlays will not be acceptable.**

Wheel wells shall have semicircular black polymer composite inner liners that are bolted to the wheel well panel and supported inboard by brackets that are connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner shall be removable for access to suspension assembly for repairs. There shall be no exception to the bolted wheel well inner liner requirement.

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, all seams sealed, and automotive undercoated to prevent corrosion in the fender well area.

The fender wells shall be trimmed with a polished stainless steel fenderettes. Aluminum fenderettes shall not be acceptable. The stainless steel fenderettes 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 fenderettes and the inner liner surfaces.

28-11-2500

FRONT AND REAR COMPARTMENT CORNERS

All four outer corners, two front and two rear, shall have a minimum of a **1" radius bend** to provide additional strength and also to distribute fatigue throughout the entire corner instead of on one point such as on a 90 degree straight bend. 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.

28-11-2505

FRONT COMPARTMENT FACE - ALUMINUM TREADBRITE 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.

28-11-2510

REAR COMPARTMENT FACE - FINISH PAINTED

The outer (taillight area) vertical surface of the rear compartment face shall be finish painted.

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.

10622-0005

Toyne Inc.

28-21-5000

ROLL UP COMPARTMENT DOORS

For all compartments requiring roll up doors:

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 endcaps 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 front 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 (2) surface mounted latch points, mounted one (1) 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.

28-21-7500

No roll up door shrouds

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.

43-77-1010

DRIVER'S SIDE COMPARTMENT IN FRONT OF THE REAR WHEELS

A compartment shall be provided in front of the rear wheels. The compartment shall be 66" high x 36" wide with the lower 28" of the compartment being 26" usable depth and the remaining upper section being 14" usable depth. The compartment shall have a roll up door with an opening 57.75" high x 29.25" wide.

The roll up door shall have a brushed satin finish.

This compartment shall have a minimum of 26.5 cubic feet of compartment space.

43-77-1240

DRIVER'S SIDE ABOVE WHEEL COMPARTMENT

A compartment shall be provided above the rear wheels. The compartment shall be 36" high x 63" wide x 14" usable depth. The compartment shall have roll up door with a door opening 27.75" high x 53.75" wide.

The roll up door shall have a brushed satin finish.

10622-0005

12/30/08

Toyne Inc.

This compartment shall have a minimum of 18.9 cubic feet of compartment space.

43-77-1510

DRIVER'S SIDE COMPARTMENT BEHIND REAR WHEELS

A compartment shall be provided behind the rear wheels. The compartment shall be 66" high x 56" wide with a portion of the lower section being transverse and the remaining upper section being 14" usable depth. The compartment shall have a roll up door with an opening 57.75" high x 53.25" wide.

The roll up door shall have a brushed satin finish.

This compartment shall have a minimum of 41 cubic feet of compartment space.

43-77-4010

PASSENGER'S SIDE COMPARTMENT IN FRONT OF THE REAR WHEELS

A compartment shall be provided in front of the rear wheels. The compartment shall be 66" high x 36" wide with the lower 28" of the compartment being 26" usable depth and the remaining upper section being 14" usable depth. The compartment shall have a roll up door with an opening 57.75" high x 29.25" wide.

The roll up door shall have a brushed satin finish.

This compartment shall have a minimum of 26.5 cubic feet of compartment space.

43-77-4240

PASSENGER'S SIDE ABOVE WHEEL COMPARTMENT

A compartment shall be provided above the rear wheels. The compartment shall be 36" high x 63" wide x 14" usable depth. The compartment shall have roll up door with a door opening 27.75" high x 53.75" wide.

The roll up door shall have a brushed satin finish.

This compartment shall have a minimum of 18.9 cubic feet of compartment space.

43-77-4510

PASSENGER'S SIDE COMPARTMENT BEHIND REAR WHEELS

A compartment shall be provided behind the rear wheels. The compartment shall be 66" high x 56" wide with a portion of the lower section being transverse and the remaining upper section being 14" usable depth. The compartment shall have a roll up door with an opening 57.75" high x 53.25" wide.

The roll up door shall have a brushed satin finish.

This compartment shall have a minimum of 41 cubic feet of compartment space.

49-01-0430

REAR FACE COMPARTMENT

A rear compartment shall be provided on the apparatus just ahead of the rear step. The compartment shall be a minimum of 30" useable depth and shall be transverse to the side rear compartments. The compartment shall have maximum height with selected apparatus options.

10622-0005

Toyne Inc.

49-01-0900

REAR FACE COMPARTMENT DOOR - ROLL UP

The rear compartment shall have a roll up door.

49-66-2615

UPPER DOOR JAMB EXTENSIONS

The upper door jamb of the side compartments shall be extended upward on both sides providing a mounting area for side upper warning lights, scenelighting, large scale lettering, etc.

49-90-1000

13.5" REAR TAILBOARD STEP

A 13.5" 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.

49-90-4000

REAR STEP MATERIAL - NFPA ALUMINUM TREADBRITE

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

49-99-5600

RUBRAILS - BRITE ANNODIZED ALUMINUM

Extruded aluminum rubrails shall be provided on the apparatus body sides. The rubrails shall have a brite finish with annodized coating to protect the finish. The rubrails shall provide an integrated mounting location for the L.E.D. side marker lights as well as the reflectors. The rubrails shall be spaced from the apparatus body a minimum of 1/4" with poly spacers.

The rubrails must be bolted on to the apparatus body to allow easy replacement if damaged. Rubrails 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.**

49-99-5625

RUBRAIL ENDS

The rubrail ends shall be 'capped' with a high impact resistant black EPDM countoured block.

50-00-0200

HOSEBED FLOORING

The floor of the hose bed shall be constructed of fiber reinforced material. The flooring shall be fabricated of "T" beam pultrusions in parallel connected with cross slats that are first mechanically bonded and then epoxied, forming a large sheet.

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

Each "T" beam shall be constructed utilizing a core of 250,000 continuous glass fiber strands that are high

10622-0005

12/30/08

Toyne Inc.

in resistance to tension, compression and bending. An outer sheath consisting of a continuous strand mat to prevent lineal splitting and shipping shall surround the core. The sheath shall also serve to draw the protective resin to the bar surface. Both reinforcements shall be pulled through an isophthalic polyester resin, treated with antimony trioxide for fire resistance, to form a solid length.

The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. This gray coating shall be baked on.

50-00-2000

68" WIDE HOSEBED

The hosebed shall be 68" wide from side to side.

50-00-7000

HOSEBED CAPACITY

The hosebed shall have the capacity to carry the following hoseload:

50-03-1300

HOSEBED DIVIDER(S)

There shall be two (2) hosebed divider(s) in the main hosebed to partition off hose. The divider(s) shall be constructed of 3/16" thick aluminum plate material. The lower edge of the divider(s) 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 hosebed flooring, one on front and one on rear. The divider shall be held in place by two bolts on each end of the divider(s).

The upper rear corner of the divider(s) shall have a minimum of a 3" radius cut.

50-03-2700

HOSEBED COVER WITH VELCRO FASTENERS

A heavy duty vinyl coated nylon hosebed cover shall be provided to protect the hoseload from the weather. The cover shall extend from the front of the hosebed to the rear and then extend downward to cover the exposed rear of the bed and from the left side to the right side of the hosebed.

The cover shall have a double reinforced area where the cover comes into contact with the upper rear corners of the hosebed dividers. The cover shall be secured to the apparatus using velcro on the sides and lift dots on front.

The rear of the cover shall be secured to the apparatus using positive mechanical latches.

50-10-2000

LOW MOUNT ENCLOSED LADDER COMPARTMENT

A ladder storage compartment shall be provided on the right side of the apparatus with an access door on the rear. The compartment shall be located below the hose bed level and shall not be located above or through the booster tank. The compartment shall be located between the booster tank and the right side compartments.

10622-0005

Toyne Inc.

For ease of removal and replacement with limited staffing, the compartment shall be designed to carry all portable ladders vertically on their beams. Ladder racks that carry the ladders horizontally shall not be acceptable.

The compartment shall be constructed of 5052 1/8" aluminum with a brushed finish. Individual slides fabricated of 5052 H32 alloy aluminum shall be provided in the compartment on both sides to allow individual storage for all ladders. The slides shall be provided with permanently attached Rodex poly slip blocks with tapered front and rear edges allow easier loading/unloading of the ladders.

An aluminum tread plate vertically hinged door with a slam-type latch shall be provided on the compartment. The latch shall be activated by a large "D" ring control. The use of lift-and-turn or small snap type latches on this door shall not be acceptable.

All ladders shall be capable of being removed individually without disturbing the remaining ladders. The compartment shall be provided with two (2) pike pole storage brackets and a storage bracket for the 10' folding ladder.

The compartment shall have a single 5" diameter light recess mounted in the left sidewall just inside the door, activated with an automatic door switch. The light switch shall be incorporated into the door ajar warning system in the cab

50-11-0800

DUO-SAFETY 24' 2 SECTION ALUMINUM LADDER

There shall be one (1) Duo-Safety model 900A 24' NFPA compliant, 2-section aluminum extension ladder provided and mounted by the manufacturer.

50-11-1100

DUO-SAFETY 14' ALUMINUM ROOF LADDER

There shall be one (1) Duo-Safety model 775A, 14' NFPA compliant aluminum roof ladder with folding hooks and feet provided and mounted by the manufacturer.

50-11-1400

DUO-SAFETY 10' ALUMINUM FOLDING ATTIC LADDER

There shall be one (1) Duo-Safety model 585A, 10' NFPA compliant aluminum folding attic ladder provided and mounted by the manufacturer.

50-20-3800

LOW MOUNT ENCLOSED HARD SUCTION

Storage for hard suction shall be provided on the left side of the apparatus with access door on the rear. The compartment shall be located below the hosebed level and shall not be located above the booster tank. The compartment shall be located between the booster tank and the left side compartments.

The compartment shall be constructed of 5052 1/8" aluminum. Individual slides constructed of PVC Storage for two lengths of hard suction.

An aluminum treadbrite vertically hinged door with latch shall be provided on the rear of the compartment.

All hard suction shall be capable of being removed individually without having to disturb the remaining hard suction

10622-0005

12/30/08

Toyne Inc.

The compartment shall have a small LED light mounted just inside the door with an automatic door switch. The light shall be incorporated into the Door Ajar warning system in the cab

50-20-9300

6"x 10' HARD SUCTION HOSES (2)

Two (2) sections of 6" 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.

51-05-0100

COMPARTMENT SHELF TRACKS - ALUMINUM

Five (5) sets consisting of two (2) heavy-duty aluminum Uni-Strut tracks shall be provided in specified compartments, one for each end of shelf. The tracks shall not be welded to the apparatus body. The Uni-strut tracks shall allow the shelving to be positioned at any location in the compartment by simply loosening a bolt on each end of the shelf, pushing inward on the bolt, and sliding the shelf to the desired location.

51-06-0100

COMPARTMENT SHELVING-SIDE COMPARTMENTS

There shall be Nine (9) shelves provided, constructed of .125" smooth aluminum with a brushed finish on the outer edge. The shelves shall have a 2" upward bend on the front and rear edges.

51-06-9100

SHELF EDGE REFLECTIVE STRIPE

Reflective stripe shall be provided on the outer edge of each shelf.

52-02-0500

SELF CONTAINED BREATHING APPARATUS BRACKETS FOR CREW SEATS

There shall be four (4) Superior Flamefighter SCBA brackets provided. The cylinder clips shall be spring steel for greater durability and long life.

A model 39015-12 NFPA 1901 approved restraint strap shall be provided for each bracket.

52-02-1300

WHEELWELL SPARE CYLINDER COMPARTMENTS - 8 CYLINDERS TOTAL

Four (4) individual spare SCBA cylinder compartments shall be provided, located two (2) on each side of

10622-0005

Toyne Inc.

the apparatus, one (1) forward of the rear axle and one (1) behind the rear axle. **Each compartment shall hold two cylinders for a total storage capacity of 8 cylinders**

A polished stainless steel access door shall be provided on each compartment. The exterior of the door shall have a highly polished finish.

52-02-2100

SCBA CYLINDER RETENTION STRAPS

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

52-15-0150

TURTLE TILE FLOOR MATS

All compartment floors shall be provided with 3/4" thick Turtle Tile modular 12' x 12" square tiles with perforated top surface for ventilation and air circulation. The tiles shall be easily removable for cleaning the compartment. The tiles shall interlock into each other to form a "one piece" floor liner.

52-15-0175

TURTLE TILE - GRAY

The Turtle Tile shall be gray in color.

52-20-0500

ROLL OUT TRAY

There shall be three (3) roll out tray(s) provided. The tray shall be constructed of 3/16" aluminum. The tray shall have a 2" upward bent lip on all four sides of the tray.

Grant, or equal, 250 lb. total capacity heavy duty ball bearing type telescoping slides shall be provided.

A positive latching mechanism shall be provided to hold the tray in either the fully open or fully closed position.

52-20-9100

ROLL OUT TRAY EDGE REFLECTIVE STRIPE

Reflective stripe shall be provided on the outer edge of each roll out tray.

52-23-5500

VERTICAL HINGED TOOL BOARD

There shall be one (1) vertically hinged tool board(s) provided. The tool board shall be constructed of 3/16" aluminum. The tray shall have a 1" bent lip on all four sides of the board.

53-99-9990

COMPARTMENT INTERIOR FEATURES

Each high compartment shall have two adjustable shelves. The compartment above the wheels on the

10622-0005

Toyne Inc.

passenger side shall have one adjustable shelf.

The driver and passenger side rear compartments shall have a roll out tray. The rear facing compartment shall have a roll out tray.

The compartment above the wheels on the driver side shall have a hinged out pegboard type toolboard.

55-50-1950

FOLDING ACCESS STEPS

All access steps provided on the apparatus shall support a minimum static load of 500 lbs. and be mounted in accordance to recommended mounting procedures as outlined by NFPA 1901. The steps shall be **minimum** of 6.5" wide x 6.5" depth. The steps shall be attached to the apparatus using stainless steel bolts with locking type nuts.

55-50-1980

RIGHT FRONT COMPARTMENT ACCESS STEPS

Three NFPA compliant folding steps shall be provided on the right side front compartment face.

55-50-1985

LEFT FRONT COMPARTMENT ACCESS STEPS

Three NFPA compliant folding steps shall be provided on the left side front compartment face.

55-50-1991

LEFT REAR ACCESS STEPS

Three NFPA compliant folding steps shall be provided on the rear of the apparatus on the left side.

56-00-0050

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. The rails shall comply with NFPA 1901.

56-00-0200

REAR VERTICAL HAND RAILS

Two NFPA compliant handrails shall be provided, one each side of the apparatus body on the rear for boarding the rear step.

56-00-0500

RIGHT FRONT GRAB RAIL

A 12" NFPA compliant horizontal handrail shall be provided on on the right front of the apparatus towards the front of the hosebed.

56-00-0501

LEFT FRONT GRAB RAIL

10622-0005

Toyne Inc.

A 12" NFPA compliant horizontal handrail shall be provided on on the left front of the apparatus towards the front of the hosebed.

56-00-0526

LEFT REAR GRAB RAIL

A 12" NFPA compliant horizontal handrail shall be provided on on the left rear of the apparatus towards the rear of the hosebed.

56-00-1000

48" INTERMEDIATE REAR HORIZONTAL HAND RAIL

A 48" intermediate horizontal handrail shall be provided on the rear of the apparatus.

59-10-0105

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.

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

10622-0005

12/30/08

Toyne Inc.

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.

59-11-0100

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 a scaleable electrical harness utilizing Duetsche 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.

The Base System Shall Include:

Toyne Inc.

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.**

59-11-0602

V-MUX VFD DISPLAY PANEL

An interface display shall be provided on the cab control console to report and display "Real Time" data.

59-11-4000

AUTOMATIC HIGH IDLE FUNCTION

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

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 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

10622-0005

Toyne Inc.

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.

60-01-1434

ILI - LED COMPARTMENT LIGHTING

All apparatus body compartments that are accessible from ground level shall each have two ILI track type L.E.D. lights vertically mounted one on each side of the compartment .

Any ladder or hard suction compartments accessible from ground level shall have a 12" length of track type ILI L.E.D. lighting.

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. **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.

10622-0005

12/30/08

Toyne Inc.

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.

60-03-1500

KUSSMAUL AUTO-CHARGE 20/20 BATTERY CHARGER/AIR COMPRESSOR

A Kussmaul model 091-20/20-B1-S-KIT battery charging and air compressor system shall be installed on the apparatus.

The battery charger shall be a Kussmaul Auto-Charge 20/20 model 091-20/20 fully automatic battery charger with 20 amp output shall be installed on the apparatus. Remote voltage sensing shall be provided to compensate the charger output for the voltage drop in the charging wires. A 0-25 ampere meter shall be provided on the charging unit to indicate charge rate.

The air compressor shall be a Kussmaul Auto-Pump 120 volt model 091-9B-1. The compressor have a .76 cfm open flow with a maximum pressure of 100 psi. The pressure switch shall be pre-set at 70 psi cut-in and 90 psi cut out. The charger and air compressor shall be powered from a Kussmaul 15 amp 120 volt Super Auto-Eject model 091-55-15-120 with a springloaded yellow cover. The unit shall automatically eject the connecting plug when the engine is cranked.

A NEMA 5-15P mating female cord end shall be shipped loose with the apparatus to allow the Fire Department to connect cord end to a Fire Department provided charging cord.

60-10-1900

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.

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

10622-0005

Toyne Inc.

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.

65-03-8915

ZONE A UPPER WARNING LIGHTING

A Code 3 model RX2758NFPA1 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 REF8 - 8 LED reflector prism module.

The outer sections shall each have two red REF8 - 8 LED reflector prism modules.

Both ends shall have two red REF12 - 12 LED reflector prism modules.

65-65-5000

ZONE A LOWER WARNING LIGHTING - FRONT

Two Code 3 model 65BZR 4"x6" red L.E.D.'s shall be mounted on the lower front area of the apparatus, one each side. A chrome bezel shall be provided around the lights.

65-71-8000

ZONES B & D LOWER WARNING LIGHTING - SIDES

Zone B Right Side Lower Lighting

Three Code 3 model OPX-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. One light shall be mid-mounted.

Zone D Left Side Lower Lighting

Three Code 3 model OPX-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

10622-0005

12/30/08

Toyne Inc.

as possible and one red light shall be mounted as low and as far rear-ward as possible on the apparatus body. One light shall be mid-mounted.

65-77-8300

ZONE C LOWER WARNING LIGHTING - REAR

Two Code 3 model 65BZR 4"x6" red L.E.D.'s shall be mounted on the lower rear area of the apparatus, one each side. A chrome bezel shall be provided around the lights.

66-01-1020

UPPER ZONE B/D WARNING LIGHTING - SIDE

Two Code 3 model 45BZR 3" X 7" red L.E.D.'s shall be mounted on each side of the apparatus above the side compartments. A chrome bezel shall be provided around the lights.

66-10-1000

UPPER ZONE C WARNING LIGHTING - REAR

Two Code 3 model 85BZR 7" X 9" red L.E.D.'s shall be mounted on the upper rear of the apparatus. A chrome bezel shall be provided around the lights.

67-01-0400

CODE 3 NASL39 ARROWSTICK

A Code 3 model NESL39 39" 8 lamp L.E.D. Arrowstick shall be provided and mounted on the rear of the apparatus. A NASL8DC control head shall be provided. The controller shall be capable of the following functions:

Arrow-left, Arrow-right, Center-out, Alternating flash, Fast/slow arrow speed control, and hi/lo intensity.

The Arrowstick shall be subject to load management shedding to comply with NFPA 1901.

68-01-0100

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 speaker installed shall be designed to fit bumper type.

74-45-0600

HOSEBED LIGHT

One rectangular light shall be provided and mounted in the front of the hosebed .

The light shall be controlled by a switch mounted on the rear of the apparatus. The light shall have a park

10622-0005

Toyne Inc.

brake cut out that will cut off power to the lights when the park brake is released.

The light shall be subjected to load management shedding to comply with NFPA 1901.

80-71-2000

HONDA EM6500 6.5 KW GASOLINE PORTABLE GENERATOR

A Honda EM6500 6.5 kw gasoline powered portable generator shall be provided and mounted to manufacturers recommendations.

The generator shall have an 13 horsepower 4 stroke single cylinder OHV engine with low oil pressure alert, automatic idle switch, automatic voltage regulator, and voltmeter.

The generator shall have electric start capabilities as well as a manual recoil system. The electric start shall be connected to the chassis battery system through the master battery switch. A quick release connection shall be provided to allow the generator to be used in portable mode.

A 6.6 gallon integral gasoline tank shall be provided with the generator unit. The generator consume approximately 3/4 gallons per hour.

The exhaust shall be mounted in a manner which will direct the exhaust away from the pump operators position or any driver, officer, or crew entry doors. The exhaust shall be properly shielded, guarded, or spaced from the apparatus body to prevent thermal damage or inadvertant contact by personnel.

The generator shall have low oil pressure shutdown. A generator mounted start/stop switch shall be provided on the generator.

The generator shall be 120/240 volts AC (48.5/22.9 amps), single phase, rated at 5,500 watts. The generator shall produce electric power at 60 cycles +/- 5 cycles. Except where superseded by the requirements of NFPA 1901, all components, equipment, and installation procedures shall conform to NFPA 70, National Electric Code, (NEC).

Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed.

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

OPERATION INSTRUCTIONS

Instructions that provide the operator with the essential power source operating instructions, including the power-up and the power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

A Power Source Specification Label shall be permanently attached to the apparatus near the operators control panel. The label shall provide the operator with the following information:

- Rated voltage(s) and type (ac or dc)
- Phase
- Rated frequency (at rated voltage(s))
- Rated amperage
- Continous rated watts
- Power source engine speed.

Toyne Inc.

80-73-0100

GENERATOR MOUNTING LOCATION

The generator shall be mounted in the passenger's side front compartment.

80-73-2000

GENERATOR ROLL OUT TRAY

There shall be a roll out tray provided for the generator.. The tray shall be constructed of 3/16" aluminum. The tray shall have a 2" upward bent lip on all four sides of the tray. The corners shall be welded and ground smooth. Heavy duty ball bearing type telescoping slides shall be provided. A positive latching mechanism shall be provided to hold the tray in either the fully open or fully closed position.

80-98-0100

GROUNDING

Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding. An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC. The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor, properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.

MAIN OVERCURRENT PROTECTION DEVICE

A main overcurrent protection device shall be provided on the generator. The device shall be factory installed by the generator manufacturer.

WIRING METHODS

All fixed wiring systems shall be either metallic or nonmetallic liquid tight conduit rated at not less than 194 degrees Fahrenheit or shall be type SO or SEO with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit.

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring.

All wiring shall be separated by a minimum of 12", or properly shielded, from exhaust piping and shall be separated from any fuel lines by a minimum of 6".

Electrical cord or conduit shall be supported within 6" of any junction box and at a minimum of every 24" of continuous run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.

10622-0005

12/30/08

Toyne Inc.

80-98-5100

NFPA 1901 110/220 VOLT POWER SOURCE TESTING

Electrical System Testing:

The wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test shall be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit closed position. This test shall be conducted after all body work has been completed.

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

NFPA Operational Test

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

The prime mover shall be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating. The power source shall be operated at 100 percent of its nameplate voltage for a minimum of 2 hours unless the system meets category certification as defined in NFPA-1901.

80-98-5120

120/240 VOLT ELECTRICAL EQUIPMENT INSTALLATION

All 120/240 electrical equipment shall be installed by the apparatus manufacturer. This shall include any item related to the system, including, but not limited to the following:

- Generator
- All scenelighting accessories.
- All outlets, and cord reels (where applicable)
- Breaker panel.

To maintain the integrity of the entire apparatus electrical system, all 120/240 equipment must be installed by the apparatus manufacturer. Installation by the apparatus manufacturer will also allow the electrical system to be NFPA tested during the U.L. pump certification testing procedure.

Installation of any portion of the 120/240 system by a dealer or service center will not be acceptable. There shall be no exception to this requirement.

80-98-7100

BREAKER PANEL LOCATION

The breaker panel shall be located in the same compartment as the generator.

80-98-7600

BREAKER PANEL BOARD

Each individual circuit that is to be powered by the generator shall have a Branch Circuit Overcurrent Protection device (circuit breaker). The device shall be sized at not less than 15 amps in accordance with

10622-0005

Toyne Inc.

Section 240-3 (Protection of Conductors) of the NEC. If more than 6 individual branch circuits are required on the apparatus, the panelboard shall have a main breaker. The panelboard shall be readily visible and located so that there is unimpeded access to the panelboard controls.

All line voltage conductors located in the main panelboard shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When pre-wiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size.

80-98-7750

LOAD BALANCING

The breaker panel shall be load balanced to allow the most efficient distribution of the AC load as possible.

80-98-7800

BREAKER PANEL LOCATION

The breaker panel shall be located _____

81-06-0500

FRC OPTIMUM 500 WATT RECESSED LIGHT

Two (2) Fire Research model OPA250-S50 recess mounted light(s) shall be mounted on the apparatus.

The lighthouse shall be a 500 watt 120 volt AC and shall draw 4.2 amps creating 10,500 lumens.

81-06-4800

FRC OPTIMUM 1500 WATT TELESCOPING LIGHT

Two (2) Fire Research model OPA530-M15 bottom raising telescoping light(s) shall be mounted on the apparatus.

The lighthouse shall be a 1500 watt 220 volt AC and shall draw a maximum of 6.25 amps. The pole shall be secured in any raised position with a non directional advanced twist lock locking device. The twist lock mechanism shall have a knurled positive grip.

The light(s) shall include a three wire coiled cord which is wired into the electrical distribution panel with an individual breaker for each light (if more than one light).

The light(s) shall be electrically tested so that they are safe for their intended use. The light(s) shall be certified by Underwriters Laboratories (UL) and shall meet/exceed NFPA 1901.

82-50-0100

110/240 VOLT TELESCOPING LIGHTS CONTROLLED FROM CAB

One (1) Switching shall be provided in the cab to turn on the lights from the cab, (on only, will not auto-raise).

Each light that is specified to be operated from the cab shall have a 12 volt rocker switch with "on" indicator light in the cab. The 12 volt switch shall activate a relay that will provide 110/220 AC power to the lights.

The following lights shall have cab switches:

10622-0005

Toyne Inc.

83-01-0100 For the (2) recessed lights.

HOUSEHOLD 5-15 RECEPTACLE(S)

There shall be two (2) household type 5-15 receptacles provided.

Wet Location

All wet location receptacle outlets shall be of the grounding type with a wet location cover and installed in accordance with Section 210-7 (Receptacles and Cord Connections) of the NEC.

All wet location receptacles shall be installed not less than 24" from the ground. Receptacles on off-road vehicles shall be a minimum of 30" from the ground. The face of any wet location receptacles shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position.

Dry Location:

All receptacles located in a dry location shall be of the grounding type. Receptacles shall not be less than 30 inches above the interior floor height.

Receptacle Wiring:

All wiring for both wet and dry locations shall be routed through liquid tight flexible conduit rated at not less than 194 degrees. Each receptacle shall be wired to the panel board which shall have separate breakers for each receptacle.

Outlet Location(s):

Household duplex type receptacles shall be provided in the following locations:

83-01-1000

110/220 VOLT OUTLET LOCATIONS

The 110/220 volt outlets shall be located as follows:

83-16-1200

AKRON ELECTRIC REWIND CORD REEL

There shall be one (1) Akron model ERWC10-16 electric rewind cord reel(s) provided and properly mounted.

Each reel shall be wired to the electrical panel board through flexible PVC conduit. An individual breaker shall be provided at the panel for the reel.

A momentary push button switch shall be provided, mounted in close proximity to each reel for activating the electric rewind. The switch shall be labeled "CORD REEL REWIND".

A label shall be provided, mounted in a readily visible area adjacent to the reel to indicate the following:

- a). Current rating

Toyne Inc.

- b). Current type
- c). Phase
- d). Voltage
- e). Total cable length.

83-16-5100

CORD REEL MOUNTING LOCATION

The cord reel shall be mounted in the _____ compartment with access provided by opening the compartment doors.

83-20-3100

150' 12/3 SEOW-A ELECTRICAL CABLE

There shall be a continuous 150' length of 12/3 SEOW-A electrical cable provided on the reel(s). The cable shall be rated at 600 volts at 194 degrees.

83-20-5800

YELLOW ELECTRICAL CABLE

The electrical cable on the cord reel(s) shall be yellow.

83-20-6100

5-15 HOUSEHOLD TYPE SINGLE CORD END

There shall be one (1) NEMA 5-15 15 amp household type cord end provided for the reel cable(s).

90-00-0000

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.
6. Drive Axle Fluid.
7. Air Conditioning Refrigerant.
8. Air Conditioning Lubrication Oil.
9. Power Steering Fluid.
10. Cab Tilt Mechanism Fluid.
11. Transfer Case Fluid.
12. Equipment Rack Fluid.
13. Air Compressor System Lubricant.
14. Generator System Lubricant.

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

10622-0005

12/30/08

Toyne Inc.

SEATED AND BELTED LABEL

Permanent plate or label stating ALL PERSONNEL ARE TO BE SEATED AND BELTED WHILE VEHICLE IS IN MOTION be provided and installed in positions that are clearly visible from any personnel seating position.

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.

90-02-0000

UNDERWRITERS LABORATORIES TESTING

The apparatus shall undergo an Underwriters Laboratories Pumper Certification Test to insure that the completed apparatus meets the requirements of NFPA #1901. The certificate shall be provided to the purchaser upon completion. Underwriters Laboratories shall also perform the required testing on the entire installed electrical system. Absolutely no self-certification by the apparatus manufacturer shall be acceptable.

MANUFACTURER'S RECORD CERTIFICATION

A copy of the Manufacturer's Record of Apparatus Construction Details shall be provided to the Purchaser upon completion.

LOW VOLTAGE TEST CERTIFICATION

A Certificate of Compliance to Electrical Warning System Low Voltage Test shall be provided to the Purchaser upon completion.

LINE VOLTAGE CERTIFICATION

A Line Voltage Electrical System Test Certificate shall be provided to the Purchaser upon completion.

WATER TANK CAPACITY CERTIFICATION

A Water Tank Capacity Certificate shall be provided to the Purchaser upon completion.

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

10622-0005

Toyne Inc.

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 surfces 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 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 mea-surement instrument. Readings must be taken from a minimum of 12 seperate 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

10622-0005

12/30/08

Toyne Inc.

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.

91-00-4100

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.

91-00-8200

APPARATUS BODY COMPARTMENT INTERIOR FINISH

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

91-02-2100

LETTERING

The Apparatus Dealer shall provide and apply all vehicle lettering and numbering.

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.

91-05-1000

REFLECTIVE STRIPE - "REVERSE S" DESIGN

The reflective stripe shall be applied in a "reverse s" design. The stripe shall angle upward on the forward compartment door on the apparatus body and then continue back to the end of the apparatus.

91-05-6200

INNER CAB DOOR REFLECTIVE STRIPING - 4 DOOR

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

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.

95-00-7600

CAB ENTRY STEP COVER

10622-0005

Toyne Inc.

The OEM provided cab entry step on the side opposite the fuel tank shall be removed from the chassis provided brackets and replaced with a fabricated aluminum treadbrite "SINGLE STEP" step assembly.

The OEM provided brackets shall be modified so that the cab entry step is the same height as the apparatus body/pump compartment "runningboards". NO EXCEPTION.

FUEL TANK/STEP COVER

The OEM provided cab entry step on the same side as the fuel tank shall be removed from the chassis provided brackets and replaced with a fabricated aluminum treadbrite "SINGLE STEP" step assembly.

The OEM provided brackets shall be modified so that the cab entry step is the same height as the apparatus body/pump compartment "runningboards". NO EXCEPTION.

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.

95-03-0000

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.

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.