



## **Commercial Chassis**

The commercial chassis shall be a Freightliner Business Class M2 106 MD four (4) door and shall be supplied with the following equipment:

### **GVW Rating**

The gross vehicle weight rating shall be 35,000 lbs with an overall wheel base of 185".

### **Frame**

The chassis frame rails shall be channel type, 10-15/16" x 3-1/2" x 11/32" steel. The frame shall have a 41" rear frame overhang. The frame rails shall be clear with no protrusions outboard of the rail from the back of the cab to the rear suspension.

### **Tow Hooks**

There shall be two (2) front tow hooks, frame-mounted.

### **Front Axle and Suspension**

The front axle shall be set back with 12,000 lbs. capacity.

### **Front Suspension**

The front suspension shall be taper leaf with a 12,000 lb capacity and front shock absorbers.

### **Front Tires**

Front tires shall be 11R22.5 tubeless type 14 ply radial tires.

Black hard rubber mudflaps shall be provided behind the front tires.

### **Rear Axle**

The rear axle shall have a 23,000 lbs. capacity. 4.89 rear axle ratio.

### **Rear Suspension**

The rear suspension shall be 52" variable rate multi-leaf spring with leaf spring helper rated at 23,000 lbs capacity.

### **Rear Tires**



Rear tires shall be 11R22.5 tubeless type 16 ply radial tires.

### **Brake System**

The vehicle shall be equipped with a WABCO 4S/4M ABS brake system without traction control. Reinforced nylon, fabric braid and wire braid chassis air lines. BW AD-9 brake line air dryer with heater. Air dryer frame mounted.

### **Cooling System**

950 square inch aluminum radiator. Antifreeze to -34F, Ethylene Glycol pre-charged SCA heavy duty coolant. Gates blue stripe coolant hoses or equivalent. Constant tension hose clamps for coolant hoses. Auxiliary engine cooling using water from the fire pump. Lower radiator guard.

### **Exhaust System**

RH outboard under step mounted horizontal after treatment system assembly with RH horizontal tailpipe exiting forward of rear tires. Engine after treatment device, automatic over the road active regeneration and dash mounted single regeneration request/inhibit switch.

### **Fuel Tank**

A fifty (50) gallon rectangular aluminum fuel tank shall be mounted at the driver side. Fuel lines shall be reinforced nylon fuel hose. 6 gallon diesel exhaust fluid tank. Alliance fuel filter/water separator. Equiflo inboard fuel system. High temperature reinforced nylon fuel line. Fuel cooler.

### **Transmission**

An Allison EVS3000 automatic 5 speed transmission shall be provided. The push-button electronic shift control shall be located within easy reach of the driver and shall be indirectly lit for after-dark operation. A label shall be provided within easy view of the driver to indicate the chassis transmission shift selector position to be used for pumping.

A transmission water-to-oil cooler shall be provided in the radiator end tank.

A transmission fluid check and fill with electronic oil level check.

A five (5) year/unlimited miles parts and labor warranty shall be provided as standard by Allison Transmission.

### **Battery System**

(2) Alliance model 1131, group 31, 12 volt maintenance free 1900 CCA threaded stud batteries. Standard battery jumpers. Single battery box frame mounted LH side under cab. Wire ground return for battery cables with additional frame ground return.

### **Alternator**



The alternator shall be DR 12V 275 AMP 40-SI brushless pad with remote battery voltage sense.

### **Ember Separator**

Side of hood air intake with NFPA compliant ember screen and fire retardant Donaldson air cleaner.

### **Rims - Painted Steel**

The chassis rims shall be Accuride 22.5" x 8.25" 10 hub piloted 2-hand steel disc wheels. The rims shall be painted job color.

### **Air Horns**

Dual Stuttertone Hood Mounted Air Horns with Driver and Officer Foot Switches to be Supplied and Installed by Freightliner.

### **OEM Chassis Step Package**

The chassis shall be provided with the OEM step package on a Freightliner M2 106 and 112 chassis. Included shall be mounting plate/area for the battery charger receptacle and air inlet.

### **Battery Location**

The batteries shall be located under left hand side of cab.

### **NFPA Compliance**

The E-ONE supplied components of the apparatus shall be compliant with NFPA 1901, 2016 edition.

### **Fire Apparatus/Rescue Chassis Prep**

The following items shall be installed on the commercial chassis in preparation for fire apparatus/rescue application:

- Exhaust Extension - The chassis exhaust pipe shall be extended to the front of the right rear wheels.
- Fast Idle System - A fast idle system shall be provided and controlled by a cab or pump panel mounted switch. The system shall increase engine idle speed to a preset RPM for increased alternator output.
- Master Light Switch - The master light switch shall consist of one (1) illuminated rocker switch wired through a solenoid to accessory switches to allow pre-selected switches to be turned on or off at one time.



- Battery Master Disconnect - A heavy duty on/off single battery master disconnect switch shall be mounted in the cab within easy reach of the driver.
- Auxiliary Engine Cooler - As required for pumping applications, an engine cooler shall be installed. The engine cooler shall be required to lower engine water temperature during prolonged pumping operations and shall be controlled at the pump operator's position.

## **Tire Pressure Indicators**

The apparatus shall be provided with Real Wheels AirGuard LED tire pressure indicating valve stem caps. When the tire is under inflated by 5-10 PSI, the LED indicator on the cap shall flash red. The indicator housings shall be shock resistant and constructed from polished stainless steel. The indicators shall be calibrated by attaching to valve stem of a tire at proper air pressure per load ratings and easily re-calibrated by simply removing and re-installing them during service.

Real Wheel Part number RWC1234 was superseded by RWC1235 as of June 2015

## **Air Inlet**

A 1/4" male plug air hose inlet shall be connected to the air reservoir tank. A 1/4" inline check valve will be installed in the line. Air hose connection will provide the capability of filling the air brake system with air from an outside source. Location: driver's door step area.

## **Hood Mounted Air Horns**

Dual Stuttertone hood mounted air horns with driver and officer foot switches shall be supplied and installed by Freightliner.

## **Vehicle Speed**

Chassis speed shall be electronic limited and not to exceed a maximum of 68 MPH. Note: Speed rating may be lower based on OEM tire ratings/top speed limitations provided on chassis.

## **Freightliner Engine**

The chassis shall be equipped with a Cummins ISB 6.7 liter, 2013 EPA compliant, electronic engine.

360 HP @ 2400 RPM, (2600 RPM governed spee), 800 LB/FT @ 1800 RPM,

## **Rear Tow Eyes**

Two (2) heavy duty tow eyes made of 3/4" (0.75") thick steel having 2-1/2" diameter holes shall be mounted below the body at the rear of the vehicle to allow towing (not lifting) of the apparatus without



damage. The tow eyes will be welded to the lower end of a 5” steel channel that is bolted at the end of the chassis frame rails. The tow eyes shall be painted chassis black.

### **Tow Hooks**

The chassis shall have two (2) forward frame mounted tow hooks.

### **OEM Chassis Step Package**

The chassis shall be provided with the OEM step package on a Freightliner M2 106 and 112 chassis. Included shall be mounting plate/area for the battery charger receptacle and air inlet.

### **Battery Location**

The batteries shall be located under left hand side of cab.

### **Logo Package**

The apparatus shall have manufacturer logos provided on the cab and body as applicable.

### **Cab Door Reflective Material**

Reflective Red/Lemon Yellow material striping shall be supplied on each of the cab doors. The stripes shall be be angled from the lower outer corner to the upper inside corner, forming an "A" shape when viewed from the rear. The reflective material shall be at least 96 square inches to meet NFPA 1901 requirements.

### **Label ``Diesel Fuel Only``**

Located above each fuel filler housing shall be a metallic label that designates “Diesel Fuel Only” requirements. It shall be black with white or equivalent contrasting letters a minimum of 1/2” high.

### **Seating Capacity Tag**

A tag that is in view of the driver stating seating capacity of five (5) personnel shall be provided.

### **Battery Charger Receptacle**

A 20 amp battery charger receptacle shall be installed in the specified location.

The receptacle shall be located driver's door step area.

The cover color shall be Yellow.



## **Battery Charger**

An E-ONE LPC 20 battery charger with remote mounted LED display shall be installed.

A fully automatic charging system shall be installed on the apparatus. The system shall have a 120 volt, 60 hertz, 7 amp AC input with an output of 20 amps 12 volts DC. The battery charging system shall be connected directly to the shoreline to ensure the batteries remain fully charged while the vehicle is in the fire station or firehouse.

The system shall include a remote charging status indicator panel. The panel shall consist of two (2) LED lights to provide a visual signal if battery voltage is good or drops below 11.5 volts. The microprocessor shall be continuously powered from the battery to provide the charge status.

## **Driver Side Assembly**

The driver side assembly shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design shall provide a high strength-to-weight ratio for increased equipment carrying capacity.

The driver side body corners shall be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions shall be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

The driver side body shall be completely sanded and deburred to assure a smooth finish and painted job color.

## **Driver Side Compartments**

The three (3) driver side compartments shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments shall be modular in design and shall not be a part of the body support structure.

There shall be one (1) compartment located ahead of the rear wheels. This compartment shall be approximately 30" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in the upper 38" high section. The compartment shall contain approximately 21.4 cu. ft. of combined storage space. The door opening shall be approximately 30" wide x 68" high.

There shall be one (1) compartment located over the rear wheel. The compartment shall be approximately 56" wide x 34" high x 12" deep and contain approximately 13.2 cu. ft. of storage space. The door opening shall be approximately 56" wide x 34" high.

There shall be one (1) compartment located behind the rear wheel. The compartment shall be approximately 36" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in the upper



38" high section and contain approximately 25.7 cu. ft. of combined storage space. The lower area of this compartment shall be transverse through to the rear compartment(s). The door opening shall be approximately 36" wide x 68" high.

Each compartment seam shall be sealed using a permanent pliable silicone caulk. The walls of each compartment shall be machine-louvered for adequate ventilation.

An externally-mounted compartment top shall be provided and constructed of a 1/8" (.125") aluminum treadplate.

### **Officer Side Assembly**

The officer side assembly shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design shall provide a high strength-to-weight ratio for increased equipment carrying capacity.

The officer side body corners shall be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions shall be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

The officer side body shall be completely sanded and deburred to assure a smooth finish and painted job color.

### **Officer Side Compartments**

The two (2) officer side compartments shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments shall be modular in design and shall not be a part of the body support structure.

There shall be one (1) compartment located ahead of the rear wheels. This compartment shall be approximately 30" wide x 30" high x 26" deep. The compartment shall contain approximately 13.5 cu. ft. of combined storage space. The door opening shall be approximately 30" wide x 30" high.

There shall be one (1) compartment located behind the rear wheel. The compartment shall be approximately 36" wide x 30" high x 26" deep. The compartment shall contain approximately 16.3 cu. ft. of combined storage space. The lower area of this compartment shall be transverse through to the rear compartment(s). The door opening shall be approximately 36" wide x 30" high.

Each compartment seam shall be sealed using a permanent pliable silicone caulk. The walls of each compartment shall be machine-louvered for adequate ventilation.

An externally-mounted compartment top shall be provided and constructed of a 1/8" (.125") aluminum treadplate. The compartment top shall be removable for easy access to the main body wiring harness.



## **Ladder Storage**

Ladder storage shall be provided over the officer side compartment top.

There shall be two (2) aluminum adjustable ladder tracks vertically-mounted to the hosebed side. There shall be two (2) cast ladder brackets provided with spring-loaded hold-down handles mounted in the adjustable ladder tracks. Brackets shall be provided to protect the painted body side surface.

## **Rear Body Assembly**

The rear body shall be constructed entirely of aluminum extrusions and interlocking aluminum plates and includes a full height center rear compartment.

The rear body frame shall be 6063-T5 1.5" x 4" and 1.5" x 3" aluminum extrusions with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius and 1/8" (0.125") smooth plate. The rear extrusions shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

## **Rear Body Compartment**

The full height center rear compartment shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartment shall be modular in design and shall not be a part of the body support structure.

The compartment shall be approximately 38" wide and shall vary in height and depth dependent upon water tank capacity. The lower area of this compartment shall be transverse through to the side rear compartments.

The compartment seams shall be sealed using a permanent pliable silicone caulk. Machined louvers shall be provided for adequate ventilation.

## **Upper Rear Compartment Depth**

The upper rear compartment depth shall be reduced to allow for a lowered overall hosebed height from the ground.

## **Tailboard Step**

A tailboard step shall be provided at the rear of the body. The tailboard shall 18" in depth and in accordance with NFPA in both step height and stepping surface. The maximum rear step height to the tailboard shall not exceed 24".

The tailboard step shall be formed from 3/16" (0.188") aluminum tread plate and shall be reinforced with 6063-T5 1.5" x 3" aluminum extrusion. The tailboard shall be in accordance with current NFPA



requirements and shall include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (0.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4".

The tailboard step shall be bolted on to the body from the underside assuring a clear surface and shall be easily removable for replacement in the case of damage.

### **Beavertails**

Two (2) squared off beavertails shall be provided at the rear of the body. The beavertails shall be a part of the body framework and provide additional support to the tailboard. Each beavertail shall be constructed of formed 1/8" (0.125") aluminum tread plate and includes removable outside panels for access to internal wiring and bolt-on accessories.

### **Rear Access Handrails**

Handrails shall be provided at the rear of the body to assist ground personnel accessing the tailboard step and hose bed area. Each handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, and shall be mounted between chrome stanchions.

The handrails shall be located- two (2) handrails, one (1) on each side, appropriately sized handrail mounted vertical on the trailing edge of the body and appropriately sized handrail(s) mounted horizontal below the rear hose bed opening.

### **Single Compartment Door**

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pan shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.



The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have a gas shock-style hold-open device.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L1, R1

### **Single Compartment Door**

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pan shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have gas shock-style hold-open devices.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L2

### **Double Compartment Door**

Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall beveled and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pans shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pans shall have a 95-degree bend to form an integral drip rail.



The compartment doors shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the doors to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the primary door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have a dual stage rotary latch with a 750 lb rating to hold the door in the closed position. The latch shall be mounted at the top of the door. A stainless steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latch. The paddle handle shall be connected to the rotary latch by a 5/32" (.156") diameter rod. Cable actuation shall be deemed unacceptable due to the potential for cable stretch and slippage. The striker pin shall be 3/8" (.38") diameter with slotted mounting holes for adjustment.

The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe.

The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30 lb rating and be mounted near the top of the door (when possible).

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): R2

### **Double Compartment Door**

Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall be beveled and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pans shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pans shall have a 95-degree bend to form an integral drip rail.

The compartment doors shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the doors to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.



A polished stainless steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the primary door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have two (2) dual stage rotary latches, each with a 750 lb rating to hold the door in the closed position. The latches shall be mounted at the top and bottom of the door. A stainless steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latches. The paddle handle shall be connected to the rotary latches by 5/32" (.156") diameter rods. Cable actuation shall not be deemed un-acceptable due to the potential for cable stretch and slippage. The striker pins shall be 3/8" (.38") diameter with slotted mounting holes for adjustment.

The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe.

The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30 lb rating and be mounted near the top of the door (when possible).

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L3

### **Double Compartment Door**

Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall beveled and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pans shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pans shall have a 95-degree bend to form an integral drip rail.

The compartment doors shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the doors to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the primary door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have two (2) dual stage rotary latches, each with a 750 lb rating to hold the door in the closed position. The latches shall be mounted at the top and bottom of the door. A stainless steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latches. The paddle handle shall be connected to the rotary latches by 5/32" (.156") diameter rods. Cable



actuation shall not be deemed un-acceptable due to the potential for cable stretch and slippage. The striker pins shall be 3/8" (.38") diameter with slotted mounting holes for adjustment.

The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe.

The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30 lb rating and be mounted near the top of the door (when possible).

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): B1

### **Hose Bed Cover**

A cover constructed of Black 18 oz. PVC vinyl coated polyester shall be installed over the apparatus hose bed. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

The front edge of the cover shall be mechanically attached to the body. The sides of the cover shall be held in place with heavy duty Velcro strips running the length of the hose bed. The rear of the cover shall have an integral flap that extends down to cover the rear of the hose bed. This flap shall be secured in place with heavy duty nylon straps to comply with the latest edition of NFPA 1901.

### **Vinyl Crosslay Cover**

A cover constructed of Black 18 oz. PVC vinyl coated polyester shall be installed on the crosslay. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 per square inch.

The cover shall be held in place across the top of the body by chrome snaps. The sides of the cover shall have integral flaps that extend down to cover the sides of the crosslay. The side flaps shall be secured in place to comply with the latest edition of NFPA 1901.

### **Pump Module Width**

Pump module shall be 76" wide.

### **Pump Module Frame**

An extruded aluminum pump module shall be provided and located forward of the apparatus body. The pump module shall be constructed entirely of welded aluminum alloy extrusions and interlocking



aluminum plates. The pump module framework shall consist of 1.5" x 3" x .188" wall, 1.5" x 3" x .375" wall with center web and 3" x 3" x .188" wall extrusions.

The pump module design and mounting shall be separate from the body to allow the pump module and body to move independently of each other in order to reduce stress from frame twisting and vibration.

The exterior surface of the pump module framework shall have a sanded finish.

### **Pump Module Mounting**

The pump module shall be attached to the chassis using four (4) center bonded isolation mounts and a steel mounting frame. The isolation mounts shall be 2.75" diameter and mount to the chassis with two (2) 4" x 4" x .312" A36 steel angles.

### **Pump Access**

A pump service access door shall be provided at the front of the pump module. The door shall be secured with two (2) thumb latches. (Access door not provided on fixed cab applications)

### **Pump Module Running Boards**

The pump module shall include a running board on each side. The running boards shall be in accordance with NFPA in both step height and stepping surface. The running boards shall be formed from .125" aluminum treadplate.

### **Stepping Surface**

Each running board shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of .125". Gripping

surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". Each running board shall be bolted on to the pump module and be easily removable for replacement in the case of damage.

### **Pump Panel Opening**

The panel opening on the pump module shall be 39" wide.

### **Pump Module Height**

The pump module height shall be 75".

### **Side Mount Pump Panels**



The driver and officer side pump panels shall be constructed of 14 gauge stainless steel. Each panel shall have the ability to be removed from the module for easier access and for maintenance in the pump area.

### **Pump Access Door**

The officer side pump module shall have a three (3) piece panel, one (1) above the discharge outlets, one (1) encompassing the discharges and intakes and one (1) low for bleeder valves.

The upper two (2) pump panel sections shall have a vertical stainless steel piano type hinge with 1/4” pins along the forward edge of the pump module. The hinges shall be ”staked” on every other knuckle to prevent the pin from sliding. The panels shall have push button style latches to secure the panels in the closed position. The upper panel shall have one (1) pneumatic shock to hold the panel in the open position.

### **Pump Panel Tags**

Color coded pump panel labels shall be supplied to be in accordance with NFPA 1901 compliance.

### **Module Logos**

Logos with the OEM brand name shall be provided and shall be mounted one (1) each side on pump module/pre-connect panels. Logos shall be sized as applicable to available space on panel(s).

### **Storage Pan**

A storage pan shall be provided in the upper pump module area. The pan shall be constructed of 3/16” (.188”) aluminum treadplate and be removable to service items in the pump module below. Holes shall be provided in the corners of the pan to facilitate drainage of water.

### **Double Crosslay Hosebed**

Two (2) crosslay hosebeds shall be provided on the pump module. Each of the two (2) crosslay areas shall have a capacity for up to 200` of 2.0” double-jacket fire hose double stacked. The crosslay floor and side walls shall be constructed of 3/16” (.188) smooth aluminum plate. The floor shall be slotted to prevent the accumulation of water and allow for ventilation of wet hose. One (1) 1/4” (.25”) smooth aluminum plate fixed divider with a sanded finish shall be provided to separate the two (2) hose storage areas.

### **530 Gallon Water Tank**

A 530 gallon (U.S.) “T” booster tank shall be supplied.



The booster tank shall be constructed of polypropylene material. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The booster tank top, sides, and bottom shall be constructed of a minimum 1/2" (0.50") thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates per the tank fill inlet size.

The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments. This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward.



The booster tank shall undergo extensive testing prior to installation in the truck. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale.

Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer.

Tank capacity is 530 US gallons / 441 Imperial gallons / 2006 Liters.

## **Fill Tower Location**

Fill tower(s) shall be located offset to officer side of water tank.

## **Tank Fill 2 Akron Valve**

One (1) 2” pump-to-tank fill line having a 2” manually operated full flow valve. The valve control shall be located at the pump operator’s panel and shall visually indicate the position of the valve at all times. The fill line shall be controlled using a chrome handle with an integral tag.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.



## **Tank To Pump**

One (1) manually operated 3” Akron valve shall be installed between the pump suction and the booster tank. Includes flex hose with stainless steel hose clamps for connection to the 4" tank sump outlet . The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

A check valve shall be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank. The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times.

## **(2) Hard Suction Hose Racks**

Two (2) hard suction hose storage rack shall be provided above the officer side adjustable ladder tracks.

The storage rack shall be constructed of anodized extruded aluminum and includes two (2) spring-mounted latch handles.

Each storage rack shall be capable of storing one (1) 6” x 10` hard suction hose.

## **Ladder Brand**

The ladder brand capable of being carried on the unit shall be Alco-Lite.

## **Ladders**

The length of ladders capable of being stored shall be the following: 24' 2-section and 14' roof ladder.

## **Hose Bed Folding Steps**

Innovative Controls dual lighted LED folding steps shall be positioned to the driver side rear of the body. The steps shall be NFPA compliant for access to the hose bed storage area and in step height and



surface area. The steps shall be staggered stepped as applicable with tailboard depth, not applicable with recessed step mounting.

Innovative Controls dual lighted folding step with LED lights integral to the step on the top to provide NFPA requirements of 2 fc (20 lx) on the stepping surface. Folding step shall also have a LED light integral to the bottom of the step to meet NFPA requirements of a stepping surface up to 18” below the step. The folding step shall sustain a minimum static load of 500 lb with a 3 to 1 safety factor. The folding step shall also meet NFPA slip resistance qualifications. Corrosion resistance shall be demonstrated by a 1000 hr salt spray test with no visible signs of deterioration of the step body or hardware.

One (1) hand rail shall be installed (as applicable) in compliance with current NFPA. The hand rail shall be constructed of 6063T5 1.25” OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

## **Rear Mud Flaps**

The rear tires shall have a set of black mud flaps mounted behind the rear chassis wheels with E-ONE logo.

## **Body Mainframe**

The body mainframe shall be entirely constructed of aluminum. The complete framework shall be constructed of 6061T6 and 6063T5 aluminum alloy extrusions welded together using 5356 aluminum alloy welding wire.

The body mainframe shall include 3” x 3” 6061-T6 aluminum 3/8” (0.375”) wall crossmember extrusion or 3” x 3” I-beam section aluminum extrusion depending on the application at the front of the body . A solid 3” x 3” ”I-beam” section aluminum extrusion shall be provided the full width of the body forward and rearward of the rear wheel well. The crossmembers shall be designed to support the compartment framing and shall be welded to 1-3/16” x 3” (1.188” x 3”) solid 6063-T5 aluminum frame sill extrusions. The frame sill extrusions shall be shaped to contour with the chassis frame rails and shall be protected from contact with the chassis frame rails by 5/16” x 2” (0.31” x 2”) fiber-reinforced rubber strips to prevent wear and galvanic corrosion caused when dissimilar metals come in contact.

## **Body Mounting System**

The main body shall be attached to the chassis frame rails with six (6) of 5/8” (0.625”) diameter steel U-bolts. The rear of the body shall be spring mounted to allow for chassis flex. This body mounting system shall be used to allow easy removal of the body for major repair or disassembly.

## **Water Tank Mounting System**



The body design shall allow the booster tank to be completely removable without disturbing or dismantling the apparatus body structure. The water tank shall rest on top of a 3" x 3" frame assembly covered with rubber shock pads and corner braces formed from 3/16" angled plate to support the tank. The booster tank mounting system shall utilize a floating design to reduce stress from road travel and vibration. To maintain low vehicle center of gravity the water tank bottom shall be mounted within 5" of the frame rail top.

### **Hosebed Side Assembly**

The hosebed side assemblies shall be made of 3" x 3" slotted aluminum extrusion and 3/16" (.188") smooth plate. The hosebed side assemblies shall provide a 80" high body.

The exterior hosebed side surface shall be completely sanded and deburred to assure a smooth finish and painted job color. The interior hosebed side surface shall be completely sanded and deburred to assure a smooth sanded finish.

### **Hose Bed Capacity**

Hosebed hoseload allowance on the apparatus shall be 1200 lbs.

### **Hosebed**

The area above the booster tank shall have a hose storage area provided. The hosebed shall be constructed entirely from maintenance-free, 3/4" deep x 7.5" wide, extruded aluminum slats that shall be pop-riveted into a one-piece grid system. Each slat shall have all sharp edges removed and have an anodized ribbed top surface that shall prevent the accumulation of water and allow for ventilation of wet hose.

The hosebed shall include an open area for the fill tower(s). The hosebed design shall incorporate adjustable tracks in the forward area rearward of the fill tower(s) and the rearward area of the hosebed for the installation of an adjustable divider(s). The adjustable tracks shall hold an adjustable divider(s) mounting nut straight, so only a philips head screwdriver is required to adjust a divider(s) from side to side (as is practical with other hosebed mounted equipment).

The hosebed shall be easily removable to allow access to the booster tank below.

### **Hose Bed Divider**

There shall be a hose bed divider provided the full fore-aft length of the hose bed.

The hose bed divider shall be constructed of 1/4" (0.25") smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the divider shall have a 3" radius corner to protect personnel. The divider shall be natural finish aluminum for long-lasting appearance and shall be sanded and de-burred to prevent damage to the hose.



The divider shall be adjustable from side to side in the hose bed to accommodate varying hose loads.

### **Hose Bed Divider Hand Hold**

There shall be a hand hole cut-out(s) on the trailing edge of each hose bed divider. The cut-out(s) is specifically sized for use in adjusting of the hose bed divider.

### **Overall Height Restriction**

The apparatus shall have no overall height restrictions.

### **Overall Length Restriction**

The unit has no overall length restrictions.

### **Body Wheel Well**

The body wheel well frame shall be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 1/8" (0.125") aluminum treadplate. The wheel well trim fenderette shall be constructed from 6063-T5 formed aluminum extrusion. The wheel well liners shall be constructed of a 3/16" (.187") composite material. The liners shall be bolt-on and shall provide a maintenance-free and damage-resistant surface.

### **Rub Rail**

The pump area module(s) and body shall have rub rails mounted along the sides and at the rear. \*\*

The rub rail shall be C-channel in design and constructed of 3/16" thick 6463T6 anodized aluminum extrusion. The rub rail shall be 2.75" high x 1.25" deep and shall extend beyond the body width to protect compartment doors and the body side. The rub rail depth shall allow marker and/or warning lights to be recessed inside for protection.

The top surface of the rub rail shall have minimum of five (5) raised serrations. Each serration being a minimum of .1" in height and with cross grooves to provide a slip-resistant edge for the tailboard step and pump module running board areas. The rub rail shall be mounted a minimum of 3/16" off the pump module and body with nylon spacers. The ends of each section shall be provided with a finished rounded corner piece.

### **Equipment Capacity**

Equipment allowance on the apparatus shall be 2000 lbs. This allowance is in addition to the weight of the hoses and ground ladders listed in the shop order as applicable.



## **Pump Rating**

The fire pump shall be rated at 1250 GPM.

## **Fire Pump System**

The pump shall be a midship mounted Hale Qflo single stage centrifugal pump. The pump shall be mounted on the chassis frame rails and shall be split-shaft driven.

The entire pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (207 MPa). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump body shall be horizontally split in two (2) sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing pump mounting or piping.

The pump impeller shall be hard, fine grain bronze of the mixed flow design and shall be individually ground and hand balanced. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, corrosion-resistant stainless steel and shall be rigidly supported by three (3) bearings for minimum deflection. The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and shall be splash-lubricated. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox.

Two (2) 6" diameter suction ports with 6" NST male threads and removable screens shall be provided, one (1) each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps.

## **Mechanical Seal**

A mechanical seal shall be provided on the inboard side of the pump. The mechanical seal shall be two (2) inches in diameter and shall be spring-loaded, maintenance-free, and self-adjusting.

## **Discharge Manifold**

The pump system shall utilize a stainless steel discharge manifold system that allows a direct flow of water to discharge valves. The manifold and fabricated piping systems shall be constructed of a minimum of Schedule 10 stainless steel to reduce corrosion.

## **Pump Shift**

The pump shift shall be pneumatically-controlled using a power shifting cylinder.



The power shift control valve shall be mounted in the cab and be labeled "PUMP SHIFT". The apparatus transmission shift control shall be furnished with a positive lever, preventing accidental shifting of the chassis transmission.

A green indicator light shall be located in the cab and be labeled "PUMP ENGAGED". The light shall not activate until the pump shift has completed its full travel into pump engagement position.

A second green indicator light shall be located in the cab and be labeled "OK TO PUMP". This light shall be energized when both the pump shift has been completed and the chassis automatic transmission has obtained converter lock-up (4th gear lock-up).

### **Test Ports**

Two (2) test plugs shall be pump panel mounted for third party testing of vacuum and pressures of the pump.

### **Pump Certification**

The pump, when dry, shall be capable of taking suction and discharging water in accordance with current NFPA 1901. The pump shall be tested at the manufacturer's facility by an independent, third-party testing service. The conditions of the pump test shall be as outlined in current NFPA 1901.

The tests shall include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test shall be performed as outlined in current NFPA 1901.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure
- 50% of rated capacity at 250 psi net pump pressure

A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer's Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.



## **Steamers, Flush+1**

The pump 6" steamer intake(s) shall be mounted approximately 1" from the pump panel to back of cap when installed. The "Flush+1" dimension can vary + or - 1-1/4" or as practicable depending on the pump module width and options selected. (Example 72" or 76" modules.)

Location: driver's side, officer's side.

## **Hale Pressure Relief Valve**

A Hale pressure relief valve shall be provided and mounted on the pump operator's panel. The pump shall be equipped with an automatic pressure control device. A single bronze variable pressure setting relief valve shall be provided and be of ample capacity to prevent an undue pressure rise as outlined in NFPA 1901. The relief valve shall be normally closed and shall open against pump pressure. A relief valve control wheel with a control light to signal when open shall be mounted on the pump operator's panel.

## **Vernier Engine Throttle**

One (1) vernier type throttle shall be mounted on the pump operator's panel and shall be used to control the engine RPM. This system, specifically designed for fire apparatus, shall monitor and control the engine providing power to the fire pump. The system shall control the engine speed when the pump system has been placed into gear. The system shall monitor engine RPM and shall maintain the engines selected speed.

One (1) pump panel mounted "GREEN" indicator light shall be positioned above the throttle control on the pump operator's panel. The light shall be energized when the pump shift has been completed, chassis automatic transmission has obtained converter lock-up (4th gear lock-up), and the chassis parking brake is set.

An interlock system shall be provided to prevent the advancement of the engine speed until the apparatus parking brake is applied, the chassis transmission is in the proper gear, and the fire pump gearbox is properly engaged. When the above conditions have been met, the "OK TO PUMP" light shall be illuminated.

## **Master Drain Valve**

A manual master drain valve shall be installed on the pump panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal. The master drain shall have a rubber seal to prevent water from running out on the running board.

The manual master drain valve shall have twelve (12) individual-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.



The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

## **Priming System**

An electrically-driven Hale ESP priming pump shall be provided for the water pump. The primer shall be positive displacement rotary vane type that requires no lubricant. The primer motor shall be heat-treated, anodized aluminum specially coated for wear and corrosion resistance.

One (1) priming control, located at the pump operator's position, shall open the priming valve and start the priming motor. The priming valve shall be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear.

## **Left Intake 2.5 Akron Valve**

One (1) 2-1/2" suction inlet with a manually operated 2-1/2" Akron valve shall be provided on the left side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The outlet of the valve shall be connected to the suction side of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2-1/2" NST female chrome inlet swivel, and shall be equipped with a chrome plated rockerlug plug with a retainer device.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss.

A 3/4" bleeder valve assembly will be installed on the left side pump panel.

## **Intake Pressure Relief**

A18 Series - PRESSURE RELIEF VALVE - TFT's pressure relief valve is adjustable from 50 to 250 psi (3 to 14 bar) with easy to see 25 psi (2 bar) increments. The aluminum casting is plastic impregnated, hardcoat anodized, and TFT powder coat finished inside and out for maximum corrosion protection. Works with Darley, Waterous, or Hale bolt hole patterns for direct use on pump flanges.



## **Deck Gun 3" Discharge Akron Valve**

One (1) 3" deck gun discharge outlet with a manually operated Akron valve and 3" stainless steel pipe shall be provided above the pump compartment.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve shall be equipped with a device that limits the opening and closing speeds to comply with the current edition of NFPA 1901.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

## **(2) 1.5 Single Crosslay Akron Valve**

Two (2) single crosslay discharge shall be provided at the front area of the body. The crosslay shall include one (1) 2" brass swivel with a 1-1/2" hose connection to permit the use of hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2" heavy-duty hose coming from the pump discharge manifold to the 2" swivel. The hose shall be connected to a manually operated 2" Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 1 & 2.



## **(2) Left Panel 2.5 Discharge Akron Valve**

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the left hand side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left side discharge 1, left side discharge 2.

## **Right Panel 2.5 Discharge Akron Valve**

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the right side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 1.

## **Left Rear 2.5" Discharge Akron Valve**



One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be supplied to the left rear of the apparatus by a 2-1/2" stainless steel pipe.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left rear discharge.

## **Deck Gun Location**

Deck gun piping shall be positioned centered in deck gun channel. This location shall allow for optimal operation of a deck gun monitor once installed.

## **IC Push/Pull Control**

The apparatus pump panel shall be equipped with Innovative Controls Side Mount Valve Controls. The ergonomically designed ¼ turn push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. An anodized aluminum control rod and housing shall, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly shall include a decorative chrome-plated zinc panel-mounting bezel with areas for color-coding and/or FOAM and CAFS identification labels.

## **(7) Bleeder Drain Valves**

The bleeder/drain valves shall be Innovative Controls ¾" ball brass drain valves with a chrome-plated 1/4 turn handle. Each 1/4 turn handle grip shall feature built-in color-coding labels and a verbiage tag identifying each valve.

## **Discharge/Intake Bezel**

Innovative Controls intake and/or discharge swing handle bezels shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and/or discharge ports with color



and verbiage. These bezel are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

## **GAUGE IC 10 LED WATER TANK LEVEL**

One (1) Innovative Controls brand water tank level gauge shall be located at the pump operator`s panel to provide a high-visibility display of the water tank level. Ten (10) high-intensity light emitting diodes (LED`s) on the display module shall have a 3-dimensional lens allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance within full 180 degree visibility.

The display module shall be protected from vibration and contamination with the components being encased in an encapsulated plastic housing. The long life and extreme durability of LED indicators eliminates light bulb replacement and maintenance. Color coded cover plates shall complete the assembly of the display module to the pump panel. Each display level can be set independently for maximum reliability.

The display shall provide a steady indication of fluid level despite sloshing inside of the tank when the vehicle is in motion due to an "anti-slosh" feature.

## **Engine Gauge Package**

An engine gauge package shall be supplied at the pump operator`s panel to monitor the vehicle`s engine. The weatherproof package shall include the following:

- Tachometer - to monitor engine revolutions per minute.
- Oil pressure gauge - to monitor engine oil pressure w/integrated low oil indicator.
- Water temperature gauge - to monitor the engine water temperature w/integrated high water temperature indicator.
- Voltmeter - connected to the vehicle electrical system w/integrated high and low voltage indicator.
- Engine alarm system and buzzer alarm for audible warning.

## **2.5 Gauges**

The valve discharge gauges shall be 2 ½“(63mm) diameter Innovative Controls pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate



phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels. The gauges shall display a range from 0 to 400 psi with black graphics on a white background.

#### **4" Master Pressure Gauges w/Bezel**

The master intake and master discharge gauges shall be 4“(101mm) diameter IC pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F. Each gauge shall meet ANSI B40.1 Grade 1A requirements with an accuracy of +/- 1% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

The two master gauges shall be installed into decorative chrome-plated zinc mounting bezel that also incorporates a test port manifold and a graphic overlay that identifies the master intake and discharge gauges, the vacuum test port, and the pressure test port. The test port manifold is solid cast brass with chrome plated plugs. The master gauges shall be installed on the pump panel no more than 6 inches apart. The gauge on the left shall be the master pump intake gauge and display a range from 30” vac to 400 psi with black graphics on a white background. The gauge on the right shall be the master pump discharge gauge and display a range from 0 to 400 psi with black graphics on a white background.

#### **Data Recorder**

A vehicle data recorder system shall be provided to comply with NFPA 1901, 2009 edition. The following data shall be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status Occupied Yes/No by position
- Seat belt status Buckled Yes/No by position
- Master Optical Warning Device Switch On/Off
- Time 24 hour time
- Date Year/Month/Day



## **Occupant Detection System**

There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning shall activate when the vehicle's park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning shall consist of a graphical display that will continuously indicate the validity of each seat position.

The system shall include a display panel with LED back-lit ISO indicators for each seating position, seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.

The display panel shall be located cab dash above transmission shift panel.

## **Electrical System**

The apparatus shall incorporate a Weldon V-MUX multiplex 12 volt electrical system. The system shall have the capability of delivering multiple signals via a CAN bus. The electrical system installed by the apparatus manufacturer shall conform to current SAE standards, the latest FMVSS standards, and the requirements of the applicable NFPA 1901 standards.

The electrical system shall be pre-wired for optional computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics.

The electrical circuits shall be provided with low voltage over-current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. The over-current protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions.

## **Multiplex System**

For superior system integrity, the networked multiplex system shall meet the following minimum component requirements:



- The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application.
- Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry.
- All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors.
- Each module that controls a device shall hold its own configuration program.
- Each module should be able to function as a standalone module. No “add-on” module will be acceptable to achieve this form of operation.
- Load shedding power management (8 levels).
- Switch input capability for chassis functions.
- Responsible for lighting device activation.
- Self-contained diagnostic indicators.
- Wire harness needed to interface electrical devices with multiplex modules.
- The grounds from each device should return to main ground trunk in each sub harness by the use of ultrasonic splices.

## **Wiring**

All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines. No exceptions.

- NFPA 1901-Standard for Automotive Fire Apparatus
- SAE J1127 and J1127
- IPC/WHMA-A-620 – Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3 – High Performance Electronic Products)

All wiring shall be copper or copper alloys of a gauge rated to carry 125% of the maximum current for which the circuit is protected. Insulated wire and cable 8 gauge and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6 gauge and larger shall be SXL or SGT per SAE J1127.

All wiring shall be color coded and imprinted with the circuit's function. Minimum height of imprinted characters shall not be less than .082” plus or minus .01”. The imprinted characters shall repeat at a distance not greater than 3”.

A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.

## **Wiring Protection**

The overall covering of the conductors shall be loom or braid.



Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04” and a tensile strength of 22 lbs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other.

Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.

### **Wiring Connectors**

All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier’s component. The connectors and terminals shall be assembled per the connector/terminal manufacturer’s specification. Crimble/Solderless terminals shall be acceptable. Heat shrink style shall be utilized unless used within the confines of the cab.

### **NFPA Required Testing of Electrical System**

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA 1901. The following minimum testing shall be completed by the apparatus manufacturer:

#### **1. Reserve capacity test:**

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test fail.

#### **2. Alternator performance test at idle:**

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

#### **3. Alternator performance test at full load:**

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer’s governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA 1901 Standard, or a system voltage of



less than 11.7 volts DC for a 12 volt nominal system, for more than 120 seconds, shall be considered a test failure.

#### **4. Low voltage alarm test:**

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts DC for a 12 volt nominal system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

#### **NFPA Required Documentation**

The following documentation shall be provided on delivery of the apparatus:

- A. Documentation of the electrical system performance tests required above.
- B. A written load analysis, including:
  - a. The nameplate rating of the alternator.
  - b. The alternator rating under the conditions.
  - c. Each specified component load.
  - d. Individual intermittent loads.

#### **Multiplex Display**

The V-MUX multiplex electrical system shall include a text display.

The display shall have the following features:

- Rugged vacuum fluorescent technology
- Two twenty character lines
- Programmed to show door ajar status and diagnostic information

The display shall be located center of dash.

#### **Light Bar**

A Federal Signal JLX6001C 60" LED JetSolaris light bar shall be installed with clear domes. The light bar shall contain nine (9) SOL 6 red LED Solaris reflectors, and six (6) SOL 3 red LED Solaris reflectors.

The light bar shall be installed in the following location: Centered on the front cab roof.



## **Lower Level Warning Light Package**

Ten (10) Federal Signal QuadraFlare LED light heads with red lenses and bezels shall be provided.

The rectangular lights shall be wired with weatherproof connectors and shall be mounted as close to the corner points of the apparatus as is practical as follows:

- Two (2) QL64XF-R lights on the front of the apparatus facing forward.
- Two (2) QL64XF-R lights on the rear of the apparatus facing rearward.
- Two (2) QL64XF-R lights each side of the apparatus, one (1) each side at the forward most point (as practical), and one (1) each side at the rearward most point (as practical).
- One (1) QL64XF-R light each side of the apparatus centrally located to provide mid ship warning light.

The side facing lights shall be located at forward most position, centered in rear wheel well, and on side of beavertail.

All warning devices shall be surface mounted in compliance with NFPA standards.

## **Lower Level LED Warning Light Flash Rate**

The lower level Federal Signal QuadraFlare LED warning lights shall be set to flash at 75 quad flashes per minute.

## **Upper Rear Warning Lights**

Two (2) Federal Signal Sentry model SY12FS rotating lights with a polycarbonate base, a single 55 watt halogen lamp, and a twist-on lexan dome. Each light shall produce 175 flashes per minute. The dome colors to be driver red, officer amber.

The lights shall be located rear upper body on aerial style brackets to meet upper Zone C requirements.

## **Hazard (Door Ajar) Light**

There shall be a 2.5" red incandescent hazard light installed as specified.

The light shall be located center overhead.

## **Directional Light Wired to Warning Lights**

The rear directional light bar shall be activated when the upper level warning lights are activated to provide additional lighting, in addition to the warning lights, when the vehicle is responding to a scene.



## **Electronic Siren**

A Federal PA300 siren model 690010 solid state electronic siren with attached noise-canceling microphone shall be installed. The unit shall be capable of driving a single high power speaker up to 200 watts to achieve a sound output level that meets Class "A" requirements.

Operating modes shall include Hi-Lo, yelp, wail, P.A., air horn and radio re-broadcast.

The siren shall be recessed mounted in the cab.

## **Electronic Siren Control Location**

The electronic siren control shall be located in the center overhead.

## **Siren Speaker**

One (1) Federal Signal model ES100 Dynamax 100 watt speaker shall be flush mounted as far forward and as low as possible on the front of the vehicle. A polished model MSFMT with "E-ONE" grille shall be provided on the outside of the speaker to prevent road debris from entering the speaker.

Speaker dimensions shall be: 5.5 in. high x 5.9 in. wide x 2.5 in. deep. Weight = 5.5 lbs.

The speaker shall produce a minimum sound output of 120 dB at 10 feet to meet current NFPA 1901 requirements.

The speaker shall be located driver side front bumper.

## **License Plate Light**

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing shall be mounted at the rear of the body.

## **Body Marker Lights**

Trucklite LED clearance lights shall be installed as specified.

### **Upper Body:**

- One (1) red LED clearance light each side, rear of body to the side.

### **Lower Body:**



- Three (3) red LED clearance lights centered at rear, recessed in the rubrail.
- One (1) red LED clearance light each side at the trailing edge on either side of the apparatus body, recessed in the rubrail.
- One (1) amber LED clearance / auxiliary turn light each side front of body, recessed in the rubrail.
- A rectangular shaped marker light with a red colored lens shall be installed at the trailing edge on each side of the apparatus body/module, recessed in the rubrail.

## **Tail Lights**

Three (3) Federal Signaltech 4” (100 mm) circular LED (Light Emitting Diode) lights shall be installed each side at the rear of the apparatus.

Light functions shall be as follows:

LED red stop/tail light in upper position  
LED amber turn signal middle position  
LED clear back-up light in lower position.

The lights shall be in resilient shock absorbent mount for improved life.

The wiring connections shall be made with a weather resistant plug-in style connector.

## **Compartment Light Package**

There shall be a minimum of one (1) 4” circular single light bulb mounted in each body compartment greater than 4 cu. ft. Compartments over 36” in height shall have a minimum of two (2) lights, one (1) high and one (1) low. Transverse compartments shall have a minimum of two (2) lights, located one (1) each side.

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel. Each light shall be in a resilient shock-absorbent mount for improved bulb life.

The wiring connection for the compartment lights shall be made with a weather-resistant plug in style connector. A single water and corrosion-resistant switch with a polycarbonate actuator and sealed contacts shall control each compartment light. The switch shall allow the light to illuminate if the compartment door is open.

## **Ground Lights**

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights shall be 4”



circular with clear lenses mounted in a resilient shock-absorbent mount for improved bulb life. The wiring connections shall be made with a weather-resistant plug-in style connector.

Ground area lights shall be switched from the cab dash with the work light switch.

One (1) ground light shall be supplied under each side of the front bumper extension if equipped.

Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

### **Deck Lights**

Two (2) Unity model AGS4413 6" chrome plated 12 volt, 35 watt floodlights shall be installed at the rear of the apparatus. Each light shall be manually operated by an on/off switch at the light.

Location: rear body/beavertail area on the trailing edge up high.

### **Hose Bed Light**

One (1) 6" chrome plated 12 volt floodlight shall be installed at the front area of the hose bed to provide hose bed lighting per current NFPA 1901. The hose bed light shall be manually operated by the work light on/off switch located in the cab. An on/off switch shall also be provided on the light.

### **Crosslay Light**

One (1) 6" Unity chrome plated 12 volt floodlight shall be installed near the crosslay area to provide lighting per current NFPA 1901. The crosslay light shall be manually operated by an on/off switch located in the cab. An on/off switch shall also be provided on the light.

### **Engine Compartment Light**

There shall be lighting provided in compliance with NFPA to illuminate the engine compartment area.

### **Pump Compartment Light**

An incandescent light shall be provided in the pump compartment area for NFPA compliance. The light shall be wired to operate with the work light switch in the cab.

### **Pump Panel Light Package**

Three (3) Weldon #2030 lights shall be mounted under a light shield directly above each pump panel. The work light switch in the cab shall activate the lights when the park brake is set.



### **Cab Dome Lights**

A large (7") clear dome light with 3-position switch shall be installed above each front cab door.

### **Cab Dome Lights**

A large (7") clear dome light with 3-position switch shall be installed above each rear cab door.

### **Back-Up Alarm**

An electronic back-up alarm shall be supplied. The 97 dB alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse gear.

### **DOT Required Drive Away Kit**

Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement.

### **Un-Painted Pump/Pre-Connect Module(s)**

All applicable pump application modules shall have a sanded finish (not painted job color). Includes upper and lower pump modules, crosswalk module and/or speedlay/pre-connect module (as applicable). Rear mounted body/pump module shall be painted job color.

### **Paint Body Small**

The apparatus body shall be painted Sikkens FLNA3225 Red (Sikkens published). The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.



- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

### **Commercial Cab Paint**

The Freightliner cab shall be painted by the chassis supplier. The cab paint color shall match FLNA3225 Red (Sikkens published).

Paint shall be warranted by the cab/chassis manufacturer.

### **Cab and Body Scotchlite Striping**

A straight Scotchlite reflective stripe, 4" minimum in width, shall be applied horizontally around the cab and body to comply with NFPA 1901. The color and location of the stripe to be specified by the purchaser.

Location: bottom of stripe flush with bottom of cab and straight back.

Color: White.

### **Rear Body Scotchlite Striping**

Printed chevron style Scotchlite striping shall be provided on the rear of the apparatus. The stripes shall consist of 6" Yellow/Red alternating stripes in an "A" pattern. The striping shall be located on the rear facing extrusions, panels, doors and inboard/outboard of the beavertails if applicable.

### **Designated Standing / Walking Area Indication**



A 1" wide yellow line shall be applied to indicate the outside perimeter of designated standing and walking areas above 48" from the ground in compliance with 2016 NFPA 1901. Steps, ladders and areas with a railing or structure at least 12" high are excluded from requiring the line.

**Standard 1 Year Warranty**

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier. A copy of the warranty document shall be provided with the proposal.

**10 Year 100,000 Mile Structural Warranty**

The apparatus manufacturer shall provide a comprehensive 10 year/100,000 mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided with the proposal.

**10 Year Stainless Steel Plumbing Warranty**

The apparatus manufacturer shall provide a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

**10 Year Paint and Corrosion Warranty**

The apparatus manufacturer shall provide a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner.

The paint shall be prorated for 10 years as follows:

|                                  |      |                                                                    |      |
|----------------------------------|------|--------------------------------------------------------------------|------|
| Topcoat & Appearance:            |      | Coating System, Adhesion & Corrosion:                              |      |
| Gloss, Color Retention, Cracking |      | Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling |      |
| 0 to 72 months                   | 100% | 0 to 36 months                                                     | 100% |
| 73 to 120 months                 | 50%  | 37 to 84 months                                                    | 50%  |
|                                  |      | 85 to 120 months                                                   | 25%  |



Corrosion perforation shall be covered 100% for 10 years. Corrosion perforation is defined as complete penetration through the exterior metal of the apparatus.

The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document shall be provided with the proposal.

UV paint fade shall be covered in a separate warranty supplied by Akzo Nobel (Sikkens) and shall be for a minimum of 10 years.

## **Electronic Manuals**

Two (2) copies of all operator, service, and parts manuals **MUST** be supplied at the time of delivery in electronic format (CD-ROMs). The electronic manuals shall include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and fire fighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

The CD-ROM shall incorporate a navigation page with electronic links to the operator's manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The CD must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer's location.