

Watsonville, CA Fire Department

One (1) Y__N__

CUSTOM FIRETRUCK CHASSIS

The chassis shall be designed and manufactured by a custom chassis manufacturer. The manufacturer shall demonstrate evidence of manufacturing similar custom vehicles for at least fifty (50) years.

The chassis shall be designed and manufactured for heavy duty fire service with adequate strength and capacity for all components as detailed within these specifications.

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CHASSIS FRAME

The frame shall be designed to industry standards. The manufacturer shall provide a life time frame warranty to the original purchaser of the chassis. The frame rails shall be 10.5" x 3.5" x .375" heat treated steel.

The rails shall be 110,000 psi minimum yield and shall have a minimum section modulus of 18.34 cu. in. calculated by using the square corner shape method. The resulting frame rail resistance to bending moment shall be 2,017,400 in. lb. per rail. The cross members shall be bolted in place using grade 8 bolts, hardened washers, and grade C distorted thread locknuts. Flanged head fasteners and nylon locking nuts are not acceptable. The top of the frame rails shall be free of bolt heads.

Frame engine cutouts shall be made with a plasma torch to minimize the heat affected zone of the cut. All cutouts shall have a minimum of 6 inch transitions between rail flange cut depths to reduce the stress concentrations throughout the cutout area. The root of all transition areas shall have a minimum of a 2 inch radius to reduce stress concentrations at the root.

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FRONT BUMPER

A 12" high heavy-duty 10 gauge, polished stainless steel, wrap around, 2-rib front bumper shall be provided the full width of the cab.

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BUMPER EXTENSION

The front frame extension shall be bolted directly to the main rail. The extension and main rail joint shall have a 3/8" thick side plate for reinforcement.

The front bumper face shall extend 18 inches ahead of the front face of the cab skin.

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TOW HOOKS

Two (2) chromed tow hooks shall be provided and shall be attached directly to the front frame extension under the bumper. These tow hooks shall be attached with two Grade 8 bolts with hardened washers and Grade "C" distorted thread locknuts.

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FRONT AXLE

The front axle shall be a MERITOR/ROCKWELL model "FL-941c" with an 18,740 lb. capacity.

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The front axle shall be equipped with oil bath type oil seals. The spindles shall be equipped with transparent covers for oil level inspection.

Front springs shall be a minimum of ten (10) leaf elliptical type, 53" x 3-1/2" x .499" forged steel. Capacity at ground of 18,740 lbs. The spring rate shall not exceed 3,000 lbs/in deflection. The front springs shall have a military wrapper for safe operation.

All front spring pins shall have grease fittings for lubrication.

Double acting hydraulic shock absorbers are to be installed. These shocks shall have an effective piston diameter of 1.48"

The entire front suspension shall be designed for heavy duty custom fire apparatus.

The steering shall be equipped with a single SHEPPARD M110 integral power steering gear.

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FRONT AXLE BRAKES

The front brakes shall be Cam-Master Q Plus, 16-1/2" X 6" (419 x 152), S-Cam; air operated heavy duty brakes for increased stopping power and brake life in severe braking applications.

The "S" cam brakes shall incorporate a double anchor pin design, for stability and smooth consistent stopping. The camshafts shall be heat treated with rolled spline construction.

The front axle shall be equipped with automatic slack adjusters (ASA) to provide optimum brake performance.

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CRAMP ANGLE

The chassis shall have a turning cramp angle of 45 degrees. Both left and right turns have a full 45 degree cramp angle with tires and wheels mounted on the axle and installed in the chassis. The 45 degree cramp angle is achieved irrespective of options such as front suctions and disc brakes.

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MERITOR/ROCKWELL STANDARD AXLE WARRANTY

The Meritor/Rockwell axle shall have a standard five (5) year unlimited mileage parts and labor warranty. Meritor shall provide a one (1) year parts and labor warranty for wheel seals. The seal warranty shall apply to standard Meritor wheel seals and not to other specified seals. Customer specified seals shall have a parts only warranty.

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REAR AXLE

The rear axle shall be a MERITOR/ROCKWELL model "RS-24-160" with a 24,000# capacity for the fire service.

The rear axle shall be equipped with oil bath type wheel end seals.

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One (1) **VEHICLE TOP SPEED** Y__N__

The rear axle shall be geared for a top speed of 62 to 65 mph at engine governed RPM.

One (1) **SINGLE AXLE REAR SUSPENSION** Y__N__

The rear springs shall be a minimum of seventeen (17) main including four (4) auxiliary leaves. The rear suspension shall have a rating of 27,000 lbs. Capacity. The rear suspension shall be a "self-leveling" slipper type with a main torque leaf that contains a military wrapper. The torque leaf shall contain a bronze bushing for long service life.

The rear hangers are to be of the slipper design. The rear suspension deflection rate shall not exceed 3,790 lbs. per inch.

One (1) inch diameter rear suspension U-bolts are required.

Two (2) channel type cross members shall be mounted in the rear suspension area, bolted to the frame rail to form a rear suspension support member.

One (1) **REAR AXLE BRAKES** Y__N__

The rear brakes shall be Cam-Master, 16-1/2" X 7" (419 x 178), S-Cam; air operated heavy duty brakes for increased stopping power and brake life in severe braking applications.

The "S" cam brakes shall incorporate a double anchor pin design, for stability and smooth consistent stopping. The camshafts shall be heat treated with rolled spline construction.

The rear axle shall be equipped with automatic slack adjusters (ASA) to provide optimum brake performance.

One (1) **MERITOR/ROCKWELL STANDARD AXLE WARRANTY** Y__N__

The Meritor/Rockwell axle shall have a standard five (5) year unlimited mileage parts and labor warranty. Meritor shall provide a one (1) year parts and labor warranty for wheel seals. The seal warranty shall apply to standard Meritor wheel seals and not to other specified seals. Customer specified seals shall have a parts only warranty.

One (1) **LASER ALIGNMENT** Y__N__

The chassis shall have a laser alignment performed at the factory before delivery.

HME utilizes the newest generation of laser-assisted products. This system provides an accurate measuring system for wheels, axles and frames. The system is based on a laser technique using the vehicle's center line as a reference point. A play detector is used to ensure that all bushings and bearings are free from excess play. This system allows for exact and reliable system to measure and adjust wheel toe-in and camber, as well as measuring distorted and deformed axles.

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Tow In Front Axle - The tow in on a vehicle is set to reduce tire wear and to insure that the vehicle shall steer in a straight line. Tow in measurements are set to a positive 2.5 millimeters total, giving the vehicle 1.25 millimeters from side to side.

Tow In Rear Axle - The tow in on the rear wheels is set up slightly different in that the axle and wheels are set to ride the "crown" of the road. This is achieved by adjusting the tow to a measurement of no less than 1 millimeter, but no more than 2 millimeters. The ideal measurement is 1.5 millimeters total for both sides.

Cramp Angle - Cramp angle is set to achieve the greatest turning radius possible with the selected components of the vehicle. Each front wheel is set to zero degrees. The wheel is then turned until it reaches the steering stops. This measurement is the cramp angle.

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AIR SYSTEM

An air brake system meeting the requirements of the FMVSS - 121 shall be provided. The system shall consist of three (3) reservoirs with a 4,362 cu. in. volume. The air system shall consist of the following components:

Dual air system with a dual needle gauge, warning light and buzzer. A spring actuated parking brake built into the rear axle brakes with a manual control and warning light in the cab. These shall automatically apply in case of air system failure. A mechanical means of releasing the spring brake shall be provided in the event of total loss of air pressure.

A quick build up system shall be provided, capable of building enough air pressure to release the spring brake in less than thirty (30) seconds, when starting with the entire air system at zero pounds pressure.

The brake system shall be a split system. One (1) system serving the rear brakes and one (1) system serving the front brakes. The two (2) systems shall be connected with a double check valve that shall automatically shuttle air from the front system to the rear system should loss of air pressure occur. This system shall also modulate the amount of air so the spring brakes shall apply in direct relationship to the amount of pressure applied to the treadle valve.

The spring brakes shall be piped in such a manner that if the treadle valve is depressed while the spring brakes are applied, the spring brakes shall release and remain released as long as the treadle valve is depressed. They shall reapply immediately when the treadle valve is released.

The piping in the air system shall be 2-ply nylon reinforced color coded tubing for all stationary lines.

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AIR DRYER

The air system shall include a MERITOR/ROCKWELL / WABCO System Saver 1200 air dryer. The dryer shall have a capacity of 30 CFM of air flow.

The air dryer shall have a spin on desiccant cartridge for ease in servicing the dryer desiccant.

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The air dryer shall incorporate an integral turbo cut-off valve. The turbo cut-off valve shall close the path between the air compressor and the air dryer purge valve during the compressor "unload" cycle. This shall allow the air dryer to purge the water and contaminants without any loss of turbo boost or engine horsepower.

A 12 volt, 100 watt heated moisture ejector shall be an integral part of the air dryer. This heater shall be thermostatically controlled. The electrical connection for the heater shall use a sealed electrical connector to protect against moisture and corrosion.

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MANUAL AIR TANK DRAINS

All air reservoirs shall have manual drain valves with rubber seats to reduce air valve leaks. The reservoir drain valves shall allow the accumulation of contaminants that are collected in the reservoirs to be drained off to the atmosphere.

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MERITOR/ROCKWELL/WABCO ABS BRAKE SYSTEM

A four channel, single rear axle model, MERITOR/ROCKWELL/WABCO ABS Braking System shall be supplied.

A frame mounted electronic control unit (ECU) shall monitor and control wheel speed during braking. Wheel sensors, constantly monitoring wheel speed, send information to the ECU. If a wheel begins to lock the ECU transmits an electrical impulse to modulator valves that can apply, release or hold the air pressure in the brake chambers. The rapid modulation of air pressure prevents wheel lock-up and increases driver control.

This ABS system shall be a 4S/4M system with four (4) wheel speed sensors and four (4) modulator valves.

If a fault occurs in one wheel, that wheel shall have normal (non-ABS) brake function. The other wheels shall continue to provide the ABS function. If the ABS system should fail completely, the brake control shall be returned to normal (non-ABS) braking.

An ABS warning light shall be installed on the driver's dash message center. This warning light shall cycle through a test stage at the point of ignition turn on and remain illuminated until the vehicle reaches approximately four (4) MPH. The light shall illuminate in other conditions to warn of an ABS system failure and shall illuminate when the diagnostic function is activated.

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FRONT TIRES

The front tires shall be 315/80R22.5-18PR (J) GOODYEAR G409 MBA all weather tread, tubeless radial tires. These tires shall be mounted on 22.5" x 9.00" rims.

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Front axle GAWR shall be 18,870 lbs. @ 125 psi. **Maximum top speed 75 MPH.**

REAR TIRES

The rear tires shall be 11R22.5-16PR (H) GOODYEAR UNISTEEL G164 RTD traction tread, tubeless radial tires. These tires shall be mounted on 22.5" x 8.25" rims.

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One (1) Single rear axle GAWR using these tires shall be 24,000 lbs. @ 120 psi. Y__N__

ALUMINUM RIMS

One (1) Four polished aluminum wheels shall be supplied. The 22.5" x 8.25" wheels shall be polished on one side only. Y__N__

ALUMINUM RIMS

One (1) Two polished aluminum wheels shall be supplied. The 22.5" x 9.00" wheels shall be polished on one side only. Y__N__

ENGINE COOLANT RADIATOR

The engine coolant radiator shall have sufficient capacity to perform under the engine manufacturer installation requirements. The chassis manufacturer shall demonstrate the ability to meet this requirement with the submittal of an approved EPQ to the fire department for the apparatus.

The engine coolant radiator shall have a minimum core area of 989 square inches.

This radiator shall have drawn steel top and bottom tanks. These tanks shall have a material thickness of 16 gauge.

The tanks shall be bolted to the radiator header assemblies.

The header plates shall be made of 16 gauge brass.

The radiator tubes shall be constructed of .0068 inch thick brass and have a dimensional size of .076 inch x .625 inch. These radiator tubes shall have welded tube seams.

The radiator shall contain four (4) rows of tubes arranged in an inline profile across the radiator core. The entire radiator shall contain (184) tubes. These tubes shall have a smooth bore to allow for radiator cleaning.

In the critically stressed area, where the radiator tubes are attached to the header plates, this joint shall be accomplished with a welding process on the coolant side. In addition to the welded joint a solder fillet joint shall occur on the air side of the core creating a continuous dual bond.

The radiator shall have a louvered serpentine type core that contains fins constructed of .003 inch thick copper. These fins shall be spaced to a maximum density of 14 fins per inch of radiator tube. Each fin shall have a louvered surface for high cooling efficiency.

The radiator shall contain an integral coolant de-aeration tank. This tank shall be designed to remove entrapped air or gas from the coolant side of the radiator.

The bottom tank of the radiator shall have a drain valve for coolant removal.

The coolant system shall contain an ethylene glycol and water mixture to keep the coolant from freezing to a temperature of -34 degrees F.

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The bottom tank of the radiator shall have a transmission cooler with a plate-type design. The plates shall have internal turbulators to break up laminar oil flow across the surface. The cooler shall have 1175 square inches of surface area for water surface contact and heat transfer.

All radiator hoses shall be attached to the cooling system with stainless steel worm drive clamps.

The radiator system shall be pressurized with a cap rated per the cooling system requirements of the specific engine manufacturer.

The high efficiency engine fan shall be encompassed with a radiator shroud to provide the proper air flow from the fan blade to the radiator.

The radiator shall have recirculation baffles to eliminate the possibility of recirculation of "hot" air to the face of the radiator core. The bottom of the radiator shall have a recirculation baffle from the radiator to the frame rails.

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CHARGE AIR COOLER RADIATOR

The engine charge-air cooler shall have sufficient capacity to perform under the engine manufacturers installation requirements. The chassis manufacturer shall demonstrate the ability to meet this requirement with the submittal of an approved EPQ to the fire department for the apparatus.

This radiator shall have cast aluminum side tanks. These tanks shall have a material thickness of .200. These tanks shall be attached to the charge-air core with the ALBRAZE construction technique.

The external air fins shall be louvered serpentine and constructed of .006 inch thick aluminum.

The internal air fins shall be of the lance-and-offset design for greater air turbulence and higher efficiency. The internal fins are to be constructed of .010 inch thick aluminum.

The charge-air cooler shall be mounted directly in front of the engine coolant radiator. To reduce vibration rubber "iso" mounts shall be used for mounting of the charge-air cooler to the engine radiator.

The charge air cooler shall contain (12) rows of internal fins within a .313 x 2.632 aluminum tube assembly. This tube assembly shall be constructed of .025 thick aluminum.

The charge-air cooler shall contain thermal expansion slots to allow the expansion and contraction of the charge-air core over the wide range of temperatures that are expected in operation.

The charge air piping between the engine and charge-air cooler shall be aluminum tubing with a wall thickness of .065 inch. The system shall utilize four (4) ply silicone rubber woven Nomex hoses with stainless steel pressure bands. These bands are designed to maintain the hose shape under the pressure of the turbocharger boost

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air. All clamps used on the charge air piping are to be stainless steel constant torque and shall be installed at each joint.

Y__N__

DIESEL ENGINE

The chassis shall be powered by a Cummins diesel engine as described below:

MODEL: ISC
NUMBER OF CYLINDERS: Six
BORE AND STROKE: 4.49" x 5.31"
DISPLACEMENT: 506 cu. in. (8.3L)
RATED BHP: 330 @ 2000 RPM
TORQUE: 950 @ 1300 RPM
COMPRESSION RATIO: 17.0:1
GOVERNED RPM: 2200

Standard Equipment on the engine to include the following:

GOVERNOR: Limiting speed type

TURBOCHARGER: Wastegate design for increased boost at lower engine speed.

INJECTORS: Electronically controlled.

FUEL PRIMING PUMP: High capacity fuel lift pump for C Series engines.

AIR CLEANER: Farr or equal with fresh air intake.

OIL FILTER: A full flow / by-pass combination

LUBE OIL COOLER: Non-drainback, thermostatically controlled with full flow cooling.

FUEL FILTER: One fuel filter providing 10 micron absolute filtration with check valve.

STARTER: A DELCO, 12 volt, 38 MT-HD starter motor.

AIR COMPRESSOR: A Wabco 18.7 cfm compressor shall be provided.

ENGINE WARRANTY

The engine shall have the standard 5 year Cummins Warranty.

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ENGINE FAST IDLE

The chassis shall be equipped with an Electronic Idle Control (EIC) for the electronic engine. Preset speed is factory adjustable.

The fast idle provision shall only function when the parking brake is set and the transmission is in neutral.

Control of the fast idle is by an overhead console mounted switch.

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- One (1) **ENGINE BLOCK HEATER** Y__N__
An immersion type block heater shall be installed on the engine. It shall have a rating of 1500 watts with power of 110 VAC. The 110 VAC cord shall be coiled on the engine for routing by the Fire Department or body builder.
- One (1) **ENGINE COOLANT FILTER** Y__N__
A precharged spin-on corrosion inhibitor/water filter shall be installed in the cooling system. Shut off valves shall be supplied on both sides of the filter to facilitate element changing with out loss of cooling system fluid.
- One (1) **SILICONE COOLANT HOSES** Y__N__
The entire chassis cooling system shall have silicone hoses. This shall include all hoses that come in contact with engine coolant. (Engine, Heater, Cooling Loop when optioned, Radiator) Hose clamps approved for use on silicone hose are required.
- One (1) **AUXILIARY ENGINE COOLER** Y__N__
The cooling system shall have one (1) SENDURE auxiliary engine cooler mounted in the upper radiator water pipe. The apparatus shall have the fire pump water circulated to the cooler from a valve located on the apparatus pump panel.
- One (1) **COOLANT SYSTEM CLAMPS** Y__N__
Constant torque, shielded, hose clamps shall be used for all cooling system hoses on the chassis.
- One (1) **SPARK ARRESTOR** Y__N__
A spark arrestor shall be installed in the chassis air intake system. This arrestor shall be mounted in the behind the intake grille to filter out airborne embers.
- One (1) **EXHAUST SYSTEM** Y__N__
A single exhaust pipe shall be provided for the engine. The exhaust pipe shall be supplied with a 1500 degree, fiberglass tape with vermiculite. The wrap shall extend from the engine turbo charger to just below the frame rail. The 90 degree tail pipe shall terminate on the right side directly ahead of the rear wheels. The exhaust pipe tube shall be cut on the end with a 45 degree cut.
- One (1) **EXHAUST SYSTEM** Y__N__
The aluminized muffler shall be located under the frame on the right side of the apparatus.
- One (1) **TRANSMISSION** Y__N__
The transmission shall be an Allison 3000EVS (R) automatic transmission with electronic controls.

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The transmission shall be equipped with a lock-up control circuit that shall automatically shift the transmission into 4th gear lock-up when the pump is shifted into gear.

TRANSMISSION COOLER

An automatic transmission cooler shall be provided. The tube in bundle cooler shall be piped in the lower radiator plumbing. It shall be designed to withstand 165 psi working pressure and an intermittent pressure of 250 psi.

RETARDER CONTROLS

The following controls shall be included:

- A retarder enable selector switch.
- A retarder enabled pilot light. To illuminate when the retarder enable switch is activated.
- A retarder activated light. This light is to illuminate when the retarder is activated.
- A retarder "overheat" pilot light. This light is to illuminate when the retarder reaches a high oil temperature condition.

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FIVE SPEED TRANSMISSION

The transmission shall be programmed for five speeds. The transmission shall have the following gear ratios.

First - 3.49
Second - 1.86
Third - 1.41
Fourth - 1.00
Fifth - 0.75
Reverse - 5.03

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The chassis shall be geared for the top speed in 5th gear.

TRANSMISSION SHIFTER

The transmission shall be controlled by a push button type shift control. It shall be internally illuminated for night operation.

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TRANSMISSION RETARDER ACTIVATION

The retarder shall activate to a 1/3 application at 7 psi brake pressure. Increased retarder application in 1/3 increments shall occur with two (2) additional service brake pressure switches at 10 and 12 psi.

The brake lights shall illuminate when the transmission retarder is in operation.

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One (1) **DRIVELINES** Y__N__

Universal joints and drive shafts shall be SPICER 1710 series. The driveshaft tube shall be a minimum of 4.0" diameter with a .134" tube wall thickness. The driveshaft slip joints shall have Spicer "Glidecoat" to reduce sliding friction and thrust under high torque loads. All drivelines shall be balanced to prevent vibration.

One (1) **STANDARD TRANSMISSION WARRANTY** Y__N__

The chassis shall have a five (5) year unlimited mileage / Parts & Labor warranty for the Allison transmission.

One (1) **FUEL TANK** Y__N__

The fuel tank shall have a capacity of 50 gallons (US) and be D.O.T. certified. It shall be mounted with straps bolted to the bottom frame flange to allow for easy removal. The tank construction shall be of 12 gauge steel. The baffled tank shall be vented to prevent low vacuum and facilitate rapid filling. A drain plug shall be provided in the bottom of the tank. The tank shall have a 2" NPT fill to the driver's side of the chassis.

The fuel tank sending unit is to be mounted to the Driver's side of the fuel tank for easy replacement.

One (1) **FUEL LINES** Y__N__

Polyamide fiber, nylon braided, reinforced tubing with push-on reusable fittings shall be provided for the chassis fuel lines.

One (1) **FUEL/WATER SEPARATOR** Y__N__

The Cummins engine shall be equipped with a integrated fuel / water separator and a water in fuel sensor. The filter shall have a self venting drain valve in the bottom of the filter. This filter shall be able to remove up to 95% of dissolved water and up to 99% of free standing water.

One (1) **CUSTOM FIRETRUCK CAB** Y__N__

The cab shall be capable of seating up to six (6) fire fighters and be of a one-piece tilting, contoured front, fully enclosed design. It shall have four (4) side doors and be a 96" wide custom aluminum cab-over engine forward style. The cab shall have an "Open Space" design, free of interior walls or obstructions.

CAB MATERIALS

The cab construction shall have the following material gauges as a minimum:

Cab floor - 3/16" (.190") aluminum
Front skin - 3/16" (.190") aluminum
Cab side panels - 3/16" (.190") aluminum
Cab rear wall - 3/16" (.190") aluminum
Cab roof - 3/16" (.190") aluminum
Cab doors - 3/16" (.190") aluminum

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Roof Panel Rails - The roof panel assembly shall have extruded hat section supports bonded to the roof skin. These roof hat sections shall be joined to the Cab Roof Rail Section to complete the upper cab skeletal structure. These completed Roof Panel Rails shall provide a grid for maximum roof strength. The roof shall support a minimum weight of 250 lbs. / sq. ft. without permanent roof deformation.

Rear Wall Rails - The rear wall assembly shall have extruded hat section supports bonded to the wall skin. These sections shall be joined to provide a rear wall grid structure for maximum strength.

Cab Front Wall - The front wall of the cab shall be designed with a double wall construction to reduce the effects of exterior noise in the crew and operator compartment.

Engine Enclosure - The engine doghouse shall be constructed of welded aluminum and shall be welded into the cab as an integral part of the cab.

CAB DIMENSIONS

The cab shall have the following overall dimensional requirements:

Overall Width - 96 inches
Center of front axle to back of cab - 54 inches
Center of front axle to front of cab - 74 inches
Windshield area - 3624 sq. inches minimum
Front Grille Opening - 478 sq. inches minimum
Side Grille Opening - 63 sq. inches each min.
Cab full tilt angle - 45 degrees minimum
Cab full tilt height - 169 inches maximum

Cab interior dimensions shall be provided as a minimum in the following chart:

Driver's Lower Step Size - 10-1/2" deep minimum
Driver's Lower Step Size - 30" front to back
Officer's Lower Step Size - 10-1/2" deep minimum
Officer's Lower Step Size - 30" front to back

FRONT CAB DOORS

The forward cab doors shall be 74" high x 37" wide and shall have roll down windows and fixed front corner windows. The front door windows shall have a minimum of 702 square inch area of viewing glass per door. Each window shall have an exterior glass weather seal to prevent the influx of exterior air. The doors shall have exterior and interior paddle latches for ease of opening with a gloved hand. The paddle latches are to have a rubber gasket, on the outside, separating the handle from the finished painted surface. Each door shall be of the flush mounted design having exposed, polished, one-piece, 12 gauge stainless steel piano hinges with 1/4" hinge pins.

The cab doors shall be covered with an automotive styled ABS panel that is covered with vinyl to match the interior trim color. The front door panels shall have map pockets in each door.

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REAR CAB DOORS

The rear cab doors shall be similar to the forward doors and shall be located directly behind the front wheel well area. These doors shall be 74" high x 30" wide and shall be a flush type door with exposed, polished, full length 12 gauge stainless steel piano hinges with 1/4" hinge pins. Each door shall have roll down rear windows. The rear doors shall have a minimum of 546 square inches of viewing area per door. Each window shall have an exterior glass weather seal to prevent the influx of exterior air. The doors shall have interior and exterior paddle latches, and shall be mounted in an easy to reach location. Interior latch shall not be blocked by the seat occupant. The paddle latches are to have a rubber gasket, on the outside, separating the handle from the finished painted surface.

INTERIOR DOOR LOCKS

All doors shall have interior door locks and exterior keyed door lock controls. The door locks and the finished door assemblies shall be in conformance with FMVSS 206, with specific adherence to 49 CFR 571.206 Section 4.1.3 requiring that "Each door shall be equipped with a locking mechanism with an operating means in the interior of the vehicle". All doors shall be keyed alike. The doors shall be equipped with appropriate safety interlocks to prevent accidental locking of the doors when closed.

INTERIOR CAB STEP TRIM

The cab steps shall be completely enclosed behind each door. The top of each step shall be covered with aluminum treadplate trim.

INTERIOR CAB TRIM

The cab front interior shall have a one-piece, removable, sound absorbing headliner to cover all wiring and tubing used for lights and antenna leads. The rear headliner shall be a two-piece design similar to the front.

The rear interior wall of the cab shall have a one-piece, removable, wall covering to finish the interior trim and cover all wiring and tubing used for lights and antenna leads.

The cab dash shall be an ABS automotive styled housing with vinyl covering. A locking ABS automotive styled glove box with an 18" long grab handle for the Officer shall be furnished on the right hand side of the cab. The instrument and glove box housings shall be symmetrical in design for a pleasant appearance. The glove box shall be equipped with a cigar lighter socket with sufficient wiring to handle a 1,000,000 candlepower hand held spotlight. The glove box shall also include an interior mounted, individually switched light.

CAB GLASS

AS-1 safety laminate glass shall be used in a two piece, wrap around design with a minimum 3624 square inches of windshield area for maximum visibility.

The windshield shall be a type which is readily available from a nationally recognized automotive glass manufacturer that maintains local distribution outlets.

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All glass shall be tinted.

All fixed glass shall be installed with a one-piece triple locked rubber lacing material. Due to long term appearance two-piece chrome trim lock lacing is not desired.

SUNVISORS

Two (2) 17-1/2" by 9" black padded sun visors shall be supplied, one on each side of the windshield. Vertical adjustment shall be a minimum of 15" to allow maximum coverage.

RADIO / STORAGE COMPARTMENT

Beneath the officer's seat there shall be a storage/radio compartment approximately 19-1/2" wide x 17" long x 7" high. The compartment shall be enclosed on three sides. Access to this box shall be through an opening on the right hand side. The driver's side box shall have identical dimensions and shall have access through a louvered aluminum diamond plate bolt on door on the front of the seat box.

HEATER / DEFROSTER

A 57,600 BTU heater with a three speed fan shall be mounted in the front of the cab, centered over the windshield. This heater shall have six (6) adjustable vents to assure windshield defogging.

WINDSHIELD WIPERS

Two speed electric pantograph wipers shall be installed. These wipers shall have minimum 24" blades and have 28 1/2" wet arm electric pump washers. A 70 oz. minimum windshield washer reservoir shall be furnished. The reservoir shall be mounted inside the cab to eliminate the need to tilt the cab to fill it.

STEERING WHEEL AND COLUMN

The steering column shall be a DOUGLAS tilt / telescopic type with an integral high beam / turn signal control switch. The column shall have self cancelling design for the turn signal switch. A 4-way warning "Hazard" light switch shall be mounted on the column. For safety, a rubber boot shall be installed to cover the steering shaft from the dash to the floor.

The steering wheel shall be a minimum of 18 inch diameter, covered with a padded absorbite finish. The telescopic feature of the steering column shall be controlled by a lever on the left side of the steering column.

EXTERIOR GRAB HANDLES

The cab shall have a bright anodized extruded aluminum 24" grab handle at each door position. The aluminum shall be bright anodized for long service. Molded rubber gaskets shall be installed under the grab handles to protect the painted surface of the cab.

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FASTENERS

All cab exterior fasteners shall be stainless steel type fastened to the cab with nutserts.

BATTERY ACCESS

The rear cab steps shall have a removable kick panel, providing access to the batteries for routine maintenance and inspection.

CAB CORROSION TREATMENT

The cab shall have a corrosion preventative material conforming to Mil Spec C-16173-C, Grade 1, applied during and after construction. A 10 year warranty against perforation due to rust or corrosion shall be furnished for the cab.

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Y__N__

ENGINE DOGHOUSE

The engine enclosure shall have a hinged and latched panel to provide access to the engine oil dipstick, power steering fluid reservoir dipstick and engine coolant recovery reservoir. This access shall allow that these fluid levels can be checked and topped off, if required, without raising the cab.

The engine doghouse shall be covered on the inside of the cab with "Wispermat Barrier" material. The under side of the engine enclosure shall be covered with a sandwiched material for interior cab noise and heat rejection. This sandwiched acoustical material shall have one layer of 1/8" foam, a 3/16" single barrier septum and a 7/8" layer of foam to provide an overall thickness of 1-3/16". The sandwich material shall be chemically bonded to prevent layer separation. A finished surface treatment of metalized film shall be provided on the engine side of the barrier. The acoustical barrier shall be held in place with mechanical fasteners in addition to adhesive.

TRANSMISSION OIL LEVEL SENSOR

The transmission shall be equipped with the oil level sensor (OLS). This sensor shall allow the operator to obtain an indication of the fluid level from the shift selector. The sensor display shall provide the following checks, correct fluid level, low fluid level and high fluid level. Access to the power steering fluid maybe limited.

COOLANT RECOVERY SYSTEM

A coolant recovery system shall be installed on the chassis. This tank is designed to capture coolant overflow when the engine coolant warms and expands. As the engine cools the overflow is then pulled out of the tank and back into the radiator, thus maintaining proper coolant levels.

One (1)

Y__N__

CAB GRILLE

All cab exterior grilles shall be bright finished stainless steel. The front grille shall have a radiator rock guard to assist in preventing damage to the radiator core.

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- One (1) The cab shall have one (1) engine "hot" air exhaust and one (1) engine air cleaner intake, on each side of the cab. These openings shall be covered with a honey comb wire screen and shall have a bright polished stainless steel outer grille. Y__N__
- CAB GROUND LIGHTING**
- One (1) One (1) light shall be mounted beneath each door. These lights shall be designed to provide illumination on areas under the driver and crew riding area exits. All cab ground lights shall switchable and shall automatically activate when any cab exit door is opened. Y__N__
- REFLECTIVE MATERIAL - INTERIOR CAB DOOR**
- One (1) The cab and crew compartment doors shall have a minimum of 96 square inches of reflective material affixed to the inside of each door. Y__N__
- BACK-UP ALARM**
- One (1) A solid state electronic, variable volume backup alarm, model 60-807A shall be installed on the rear of the apparatus and wired to the backup light circuit. Y__N__
- MIRRORS**
- One (1) Two (2) single piece bright finished stainless steel West Coast Mirrors with 16-1/2" x 7" flat mirror heads shall be supplied an additional 5-1/2" x 8-1/2" rectangular lower convex mirror shall also be supplied. These mirror heads shall be mounted on spring loaded RETRAC arms. Y__N__
- CAB SIDE WINDOWS**
- One (1) Two AS-2 tempered glass, fixed side windows, 26-1/2" high x 16" wide shall be furnished, one on each side behind the forward doors. All glass shall be tinted. These windows shall be installed with a one-piece triple locked rubber lacing material. Y__N__
- COMPARTMENT OPEN LIGHT**
- A Red Open Compartment Flashing Light, WELDON 1-2030-7120, shall be mounted on the face of the overhead panel.
- This compartment open door light is wired with a flasher to the power panel for bodybuilder completion to the compartment door open circuit on the body.
- The compartment open light circuit shall be wired so that the light circuit is deactivated when the parking brakes of the apparatus are applied. Y__N__
- INTERIOR CAB LIGHTING**
- Four (4) dome lights shall be supplied. One light shall be installed immediately above each door position. These lights shall be illuminated when any door is open or individually operated with a switch mounted on the light and the battery switch is in the on position.

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One (1) **UNDER CAB ENGINE MAINTENANCE LIGHTS** Y__N__

Two (2) engine maintenance lights shall be supplied beneath the cab. These lights shall illuminate automatically when the cab is tilted to the full tilt position.

One (1) **ICC MARKER LIGHTS** Y__N__

Two (2) side combination clearance / turn signal lights shall be supplied, one (1) each side mounted ahead of the front door.

HEADLIGHTS

Four (4) rectangular halogen headlights shall be supplied mounted in a chrome plated bezel. These headlights shall be mounted in the lower position on the front of the cab.

TURN SIGNALS

Two (2) rectangular halogen turn signal lamps shall be mounted above the headlights in a chrome plated bezel. These lights shall be supplied with an amber arrow cover.

FRONT WARNING LIGHTS

Two (2) rectangular red halogen warning lights shall be supplied mounted above the headlights in a chrome plated bezel inboard of the turn signals. The left side light shall be a **steady burn**, the right side light shall be red flashing. These lights shall be supplied with red transparent covers. The control of these lights shall be by an overhead lighted rocker switch.

One (1) **ICC MARKER LIGHTS** Y__N__

Five (5) cab face mounted clearance lights shall be supplied, mounted above the windshield, in conformance with FMVSS 108.

One (1) **HEAD LAMPS "ON" IGNITION CONTROL** Y__N__

When the ignition switch is in "on" the head lamps shall be illuminated to 80% brilliance.

One (1) **WHEEL WELL LINERS** Y__N__

To reduce road splash and allow for easy cleaning, bolt in front wheel well liners are to be installed. Stainless steel material is to be used for the liner for ease of cleaning and eliminate corrosive action created by road debris. The wheel well liners are to be a minimum of 22 inches in width.

STAINLESS CAB FENDERETTES

To reduce road splash on the cab sides, polished stainless steel fenderettes shall be installed around each the wheel opening. An extruded rubber seal is to be installed between the fenderette and the cab to act as a barrier between the dissimilar metals.

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One (1)

EXTERIOR WALL DIAMOND PLATE

Y__N__

The cab exterior rear wall shall be covered with a single sheet of bright aluminum tread plate to protect the back of the cab from scratches.

One (1)

CAB TILT SYSTEM

Y__N__

The cab shall tilt a minimum of 45 degrees for ease of serving. Tilting shall be accomplished by means of a tilt pump connected to two (2) heavy duty lift cylinders. It shall be equipped with a positive locking mechanism (service lock) to hold the cab in the full tilt position. Release of the service lock shall be by means of a pull type cable assembly. The cylinders shall have a velocity fuse at the base to prevent the cab from falling in the event of a hydraulic hose failure. The cab shall be capable of tilting 90 degrees for major engine service, if necessary. The 90 degree cab tilt shall be accomplished by removing the cab cylinder pins, removing one bolt in the steering shaft, and removing the front bumper and treadplate.

The cab shall have a three (3) point cab locking system. To prevent undue stresses in the cab, the cab mounting shall incorporate a five (5) point load mounting system.

The front cab pivot/lock assemblies shall utilize four (4) radially loaded, bonded rubber, axial mounts. These mounts shall have a maximum radial load rating of 925 pounds each and a torsional rating of 25 lbs-in/deg. Two one (1) inch diameter cab pivot pins shall be installed at the front of the cab. Each pivot pin shall have a grease fitting to allow for lubrication to the pivot area.

The rear cab lock shall be center point mounted to prevent normal twist of the chassis from affecting the cab mounting, cab structure and windshield areas of the cab. This rear cab lock shall be mounted on a chassis cross member to provide a stable platform for the locking system. This locking system shall automatically open prior to the cab tilting and automatically relatch when the cab is lowered completely into the travel position.

Two (2) outboard frame mounted urethane "V" blocks shall be provided at the rear of the cab. These dual purpose mounts shall align the cab upon lowering as well as provide non-latching support for the cab in the down position. With this system, extreme chassis twist shall allow the cab to move independently of the rear cab supports, reducing the structural stress damage often caused by outboard dual cab locking systems.

An electric-over-hydraulic cab tilt pump shall be supplied. This pump shall have a remote control for cab tilting operation. The control shall be "safety-yellow" in color.

One (1)

ACRYLIC URETHANE FINISHES

Y__N__

The manufacturer shall warrant the Acrylic Urethane finishes on a fire and emergency vehicle for a period of five years from its date of delivery.

This warranty shall apply only to the finished areas for the following defects:

- A. Cracking or Checking.
- B. A total loss of gloss caused by chalking or fading.
- C. Peeling of the top coat or all layers included in the process from the substrate.

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D. Spot or, random discoloration in the overall finish.

This warranty does not apply to:

- A. Corrosion originating from within the apparatus.
- B. Hazing of the paint caused by improper abrasive detergents, or by incidental chemical exposure.
- C. Scratches, abrasions, or stone chips caused intentionally or accidentally.
- D. Homogenous darkening of the finished color.
- E. Blemishes or blistering caused by corrosion originating from within the apparatus.
- F. Blistering or peeling of lettering, and stripping.
- G. Multistage fluorescent finishes.
- H. Accidents.

In the case of warranty claim, repair of all non-warranty blemishes shall be negotiated prior to the warranty refinish or repair. Transportation of the vehicle to the factory authorized repair center shall be the responsibility of the owner.

One (1)

Y__N__

CHASSIS PAINT

The frame and running gear shall be painted gloss black enamel. The running gear shall consist of the axles, drivelines, air tanks, steering gear, frame mounted brackets, draglink(s), and fuel tank.

The air system piping and electrical harnesses shall not be installed in the frame at the time of the frame painting. This shall insure complete coverage of paint behind those areas, as well as to insure that the air piping and wiring harnesses do not have paint applied to them, hindering troubleshooting.

One (1)

Y__N__

CAB EXTERIOR FINISH

The exterior doors and all fixed cab glass is to be removed from the cab prior to the paint and body process beginning.

The final finish of the cab shall be to fire apparatus standards; exhibiting excellent gloss durability and color retention properties.

PREPARATION

The removal of all contaminates and oxidation is essential to the final effect of a finish system, the cab shall be pre-cleaned with a Wax and Grease Remover and prior to evaporation, towel dried.

To remove all oxidation and foreign materials, the cab shall be sanded with a 180 grit abrasive using an orbital type disc sander.

All weld marks and other major surface imperfections shall be filled with a polyester type body filler, prior to body filler application special attention shall be given to the areas requiring filler again sanding and cleaning.

The body fillers shall be thoroughly mixed in accordance with the manufacturers directions.

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After the final coat of filler is sanded, spray polyester shall be applied in sufficient amounts as to provide a final base and sanded with abrasive paper.

PRECLEAN

Within 45 minutes of pretreat the cab must be again washed with a Wax and Grease Remover using a "Scotch rite pad". Towel dry prior to evaporation.

Special precaution shall be taken NOT to saturate any polyester body fillers with the cleaning solvents.

PRETREAT AND PRIMERS

The pretreat and primer applications shall be made in two independent steps. A combined pre-treat/primer one product application shall not be allowed as a substitute.

The prepared substrate shall be pretreated with an acid curing 2-component Transparent Primer. This pretreat shall be designed to provide corrosion protection and to create an adhesive bond between the substrate and the surface applications.

It is critical that the body fillers not receive a saturation of solvents associated with the pretreat application. Only the pretreat over spray resulting from product application to the adjacent metal areas should be allowed to come in contact with the body fillers.

All polyester body fillers are porous, and shall absorb liquids. Solvents when absorbed not only soften but shall create swelling of the polyester filler. After sanding and later shrink the fillers shall create blemishes in the painted surfaces.

Prior to complete primer application, each area with applied body fillers be pre-coated with a 2-dry applications of primer (sander surfacer) of which shall be allowed to "Touch Dry" between coats. This procedure shall isolate the filled areas and protect them from subsequent product applications.

The primer (sander surfacer) shall be a poly-acrylic resin, zinc and chromate free surfacer that is designed to create a superb surface smoothness, increase the depth of color, and insure top coat gloss.

The cab after pretreat and pre-coat shall be primed with a 3 to 4 medium applications of a Hi-Build Tintable Surfacers.

To create a finish base that meets the rigid requirements of the fire and emergency service; the primed surface shall be dry sanded smooth thus removing all texture and surface imperfections with a 320 grit (minimum) sanding abrasive.

FINISH AND COLOR COATS

The color coat application shall consist of two to three applications of acrylic urethane color coat. After the color coat has been applied, the cabs shall be sprayed with 1.5 to 2.0 mills of clear coat finish. The clear coat finish is then sanded and buffed to remove any imperfections that can occur during the application of the color coat.

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The final finish shall be free of dirt and sags and shall meet a minimum grade of 7 when compared to the "ACT" general orange peel standards by "ACT" Laboratories, Inc. Of Hillsdale, MI.

The final sanding and buffing of the clear coat shall result in a flat / glass like finish. The clear coat shall also provide a UV barrier to prevent fading and chalking.

One (1)

Y__N__

INTERIOR FINISH

The interior of the cab shall be painted with spatter paint, textured black in color. The spatter paint is selected for ease of repairs when the interior is scratched.

The exterior doors and all fixed cab glass is to be removed from the cab prior to the painting process beginning.

The cab metal finish shall be covered with one coat of base self-etching primer to fill the small surface imperfections.

Then the interior of the cab is to be blocked and a coat of sealer-primer is to be sprayed to the exterior finish.

Next a sealer-primer is applied and shall be sanded to a smooth finish ready for final color coat application.

Two (2) coats of finished paint is to be applied to a final thickness of 4 mills.

The following interior components shall be covered in black vinyl to match the interior paint color:

- All seating
- Door Panels-ABS

The following interior components shall be covered in gray vinyl to match the interior paint color:

- Headliner
- Rear wall padding

The following interior components shall be covered in black hush cloth material.

- Floor mats
- Doghouse
- Doghouse covering
- Floor covering (mats)

One (1)

Y__N__

FLOOR COVERING

The front and rear floor areas of the cab shall be covered with "HUSHCLOTH" sound barrier floor mats. This floor mat shall be a three ply material with a 3/16" thick open cell isolation barrier of Polyurethane, a 3/32" thick closed cell Nitrile mid barrier for section reinforcement, and a 1/16" thick embedded pebbled grain wear surface.

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One (1) **SEAT BELT WARNING LABELS** Y__N__

The cab shall be equipped with two (2) seat belt warning labels. These labels are to be in full view of the occupants in the seated position.

One (1) **DRIVER'S SEAT** Y__N__

The driver's seat shall be a Seats, Inc. 911 air ride driver's seat. The seat shall be of the high-back style. The seat shall have adjustments for height and ride adjustment. The fore / aft adjustment of the seat shall be six (6) inches and contain a fore / aft shock absorber. The bottom seat cushion shall contain a contoured thigh support. The seat covering shall be heavy duty vinyl upholstery.

One (1) **OFFICER'S SEAT** Y__N__

The officer's seat shall be a Seats, Inc. 911 air ride officer's seat. The seat shall be an SCBA 2 + 2 style with a split head rest. The seat shall have adjustments for height and ride adjustment. The fore / aft adjustment of the seat shall be six (6) inches and contain a fore / aft shock absorber. The bottom seat cushion shall contain a contoured thigh support. The seat covering shall be heavy duty vinyl upholstery.

One (1) **OUT REAR FACING SCBA FIXED/IN FORWARD FACING FLIP SEATS** Y__N__

The two (2) outboard rear facing canopy seats shall be SEATS, INC. 911 Series Self-contained Breathing Apparatus (SCBA) type seats. These seats shall have split head rests.

The two (2) inboard forward facing canopy seats shall be flip bottom cushion non (SCBA) type seats.

The seat covering shall be heavy duty vinyl upholstery.

One (1) **SHOULDER HARNESS** Y__N__

Shoulder harness seatbelts for Driver/Officer positions shall be provided.

All rear facing seating positions shall be provided with lap type, metal to metal quick release seat belts, with automatic seat belt retraction.

The forward facing crew area seats shall be provided with shoulder harness seatbelts.

The seat belts shall be red in color.

One (1) **DRIVER INSTRUMENTATION AND CONTROLS** Y__N__

The cab dash panel shall have black textured anti-glare surface. This panel shall have a wrap around feature for easy viewing of the instrumentation. The dash panel shall be a single piece design. Each panel shall be removable for access to the gauges and wiring. These gauges shall have digitally driven analog displays for accuracy to 1 degree angular. The gauges shall have red LED back lighting for enhanced visibility. Upon on initial ignition sequence a lamp check function shall illuminate the warning light telltales, the self diagnostic message center shall

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sequence the warning light telltales if data link communications are lost. The instrument panel shall include the following gauges and indicators.

Electronic tachometer with **LCD hour meter**

Electronic speedometer with **LCD trip odometer**

Engine coolant temperature gauge. With high temperature warning light and buzzer

Engine oil pressure gauge, with warning light and buzzer

Transmission fluid temperature gauge, with high temperature warning light and buzzer

Dual air pressure gauges, with low air pressure warning light and buzzer

Voltmeter, with low voltage warning light and buzzer

Fuel level gauge

High beam indicator light

Parking brake set light

Turn signal indicator lights

The lighting control panel is to be located to the left side of the instrument panel. This panel shall have a black textured anti-glare surface. The lighting control panel shall include the following:

Headlight control switch

Dash rheostat for instrumentation lighting control

Wiper and washer control switches

The engine control panel is to be located beneath the instrument panel on the driver's right hand side. The panel shall have a black textured anti-glare surface. The engine control panel shall include the following:

Keyless ignition switch with a green pilot light

Parking brake control valve

The apparatus control panel is located beneath the instrument panel on the driver's left hand side. The panel shall have a black textured anti-glare surface. The apparatus control panel can be utilized for the pump shift controls.

One (1)

Y__N__

TRANSMISSION OVERHEAT WARNING LIGHT

A Transmission temperature light & buzzer shall be provided on the dash panel.

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- One (1) **LOW FUEL LIGHT** Y__N__
- A "Low Fuel" warning light and alarm shall be installed adjacent to the fuel gauge provided on the dash. This light shall illuminate when the apparatus fuel level reaches 25% of the fuel remaining.
- One (1) **SPEEDOMETER ACTIVATED IN PUMP MODE** Y__N__
- The speedometer and odometer shall be activated while in pumping mode.
- One (1) **LOW VOLTAGE WARNING** Y__N__
- A low voltage indicator light shall be installed on the dash. An alarm and the dash indicator light shall activate when the system voltage drops below 11.8 volts.
- One (1) **DRIVERS SIDE OVERHEAD SWITCH PANEL** Y__N__
- The apparatus warning light panel shall be mounted above the driver in the overhead console. The panel shall have a black anti-glare surface, and be angled for easy viewing of the driver. The panel shall include the following switches:
- One (1) lighted master control switch to allow for pre-selection of the other switches.
 - Thirteen (13) lighted individual lighting control and chassis option switches.
 - Each switch shall have back-lit legends with a 100,000 hour lamp for illumination.
Body Flasher
- The master lighting control switch shall be wired to three (3) 30 amp circuit breakers and three (3) 40 amp relays. Three (3) 10 gauge wires are powered by this circuit and run to the roof for light bar power. The remaining switches shall be wired to 20 amp circuit breakers and relays.
- One (1) **TOTAL SYSTEM MANAGER** Y__N__
- The apparatus shall be equipped with a Class 1 Total System Manager (TSM) for performing electrical load management. The TSM shall have outputs to supply warning and load switching requirements.
- Outputs 1-12 shall be independently programmable to activate during the scene mode, the response mode, or both. These outputs can also be programmed to activate with the ignition or warning master switch, or to sequence and shed along with the priority.
- Output 15 is a user configurable output and shall be programmable for activating between 10.5 and 15 volts.
- The TSM shall be protected against reverse polarity and shorted outputs, and be enclosed in a metal enclosure to enhance EMI/RFI protection.

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One (1) Y__N__

INTERMITTENT WIPER CONTROL

A rotary combination intermittent electric wiper / washer switch shall be provided on the left hand side of the driver's dash.

One (1) Y__N__

EMI/RFI PROTECTION

The apparatus shall incorporate the latest designs in the electrical system with state of the art components to insure that radiated and conducted electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source.

The apparatus proposed shall have the ability to operate in the environment typically found in fire ground operations with no adverse effects from EMI/RFI.

EMI/RFI susceptibility is controlled by utilizing components that are fully protected and wiring that utilizes shielding and loop back grounds where required. The apparatus shall be bonded through wire braided ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode protected to prevent transient voltage spikes.

In order to fully prevent the radio frequency interference the purchaser shall be requested to provide a listing of the type, power output, and frequencies of all radio and bio medical equipment that is proposed to be used on the apparatus.

One (1) Y__N__

ALTERNATOR

A PENNTEX 305 Amp alternator shall be installed on the engine. The alternator is externally rectified and externally regulated.

One (1) Y__N__

CHASSIS ELECTRICAL SYSTEM

The apparatus "Electrical Distribution System" (EDS) shall be mounted inside the cab to prevent moisture from entering the area. It shall be mounted under the dash on the officer's side behind a diamond plate cover.

The EDS shall be fed by one power stud:

One (1) battery positive

The battery positive stud is to be controlled by the master disconnect switch mounted on the lower right dash panel. A green light shall indicate when the ignition circuit(s) are energized.

EDS MODULE

The EDS system shall be designed with locally available **plug-in** circuit breakers and **plug-in** relays. Each component position shall be labeled to indicate it's function. All electrical connections shall be insulated and secured behind the panel face to eliminate the chance of accidental electrical shorts while performing electrical system service.

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The EDS shall control a minimum of thirteen (13) low voltage, analog switched, high amperage electrical loads.

Provision for a minimum of thirty-one (31) automatic reset circuit breakers is required to protect the vital circuits of the apparatus.

The EDS system shall be removable with only four (4) fasteners for major electrical service or modifications.

The EDS panel shall have one (1) lamp for illumination of the panel during service.

CHASSIS COLOR CODED WIRING

All chassis wiring shall be type "GXL" in accordance with S.A.E. J1128 and NFPA-1901. ALL wiring shall be **COLOR CODED** and continuously marked with the circuit number and function.

All wiring to be covered in nylon heat resistant "HTZL" loom rated at a minimum of 300 degrees F exceeding the heat requirements of NFPA-1901.

A battery "loop back" ground circuit shall be supplied for the EDS system to reduce the possible effects of Electromagnetic and Radio Frequency Interference.

The chassis cab, engine and transmission shall be electrically bonded to the chassis frame rails with braided ground straps.

ELECTRICAL SYSTEM CONNECTORS

All multiple conductor electrical connections shall be made with Packard electrical connectors. The Packard connectors shall become mechanically locked when mated.

All single wire terminations requiring special connectors with A ring or spade terminal shall be crimped, and wrapped with heat shrink tubing.

One (1)

Y__N__

BATTERY BANK

A single battery system shall be provided, utilizing four (4) high cycle type Group 31 batteries.

This system shall be capable of engine start after sustaining a continuous 150 amp load for 10 minutes with the engine off (NFPA-1901).

A battery disconnect switch (Rated at not less than 450 amps continuous) shall be used to activate the system and provide power to the power panel. A green pilot light shall illuminate to indicate that the 1 battery bank is activated.

BATTERY CABLES

All battery wiring shall be "GXL" battery cable capable of handling 125% of the actual load. It shall be run through a heat resistant flexible nylon "HTZL" loom rated at a minimum of 300 degrees Fahrenheit. All cable connections shall be machine crimped and soldered.

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STARTING CIRCUIT

One (1) engine start button is to be located on the lower right dash panel. It shall be wired to heavy duty solenoid rated at not less than 1100 amps. The battery indicator light is to be located directly above the start button to indicate that the battery bank is on.

One (1)

Y__N__

CHASSIS OPERATOR'S MANUAL

Operator's Manual w/Parts List-TWO Sets shall be provided with the chassis.

An electronic Electrical System Manual shall be provided.

- This manual shall provide complete wiring schematics for the vehicle.
- The manual shall be provided with diagrams of the vehicle showing the wiring harness routing within the vehicle. Each of these diagrams shall include the connectors between the harnesses that provide a hyperlink to a drawing of the actual connector where pin functions can be examined.
- Schematics for each system of the vehicle shall be provided with hyperlinks to the connectors for pin designations and to the vehicle drawings for harness location within the vehicle.

An electronic Air System Manual shall be provided.

- This manual shall provide complete air system schematics for the vehicle.
- The manual shall be provided with diagrams of the vehicle showing the air tubing routing within the vehicle.
- Schematics for each system of the vehicle shall be provided with hyperlinks to the tanks and valves and to the vehicle drawings for exact location within the vehicle.

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CHASSIS ADDITONS AND MODIFICATIONS

One (1) Y__N__

FRONT BUMPER GRAVELSHIELD

There shall be a horizontal gravel shield fabricated from bright 1/8" aluminum treadplate installed at the front bumper to cover the area between the bumper and the cab.

One (1) Y__N__

BUMPER EXTENSION

The chassis front bumper extension shall be supplied with the chassis.

The front bumper extension shall be 18".

One (1) Y__N__

CENTER HOSEWELL

A recessed style hose well for storage is to be provided in the center of the front bumper extension. Hose well shall be constructed of .125 aluminum material and have a smooth interior surface.

Hose well shall have a drain hole in each corner.

Exact hose well requirements shall be determined prior to construction.

One (1) Y__N__

REAR MOUNT FUEL TANK

There shall be a rear mounted fuel tank furnished with the chassis.

One (1) Y__N__

CAST ALUMINUM FUEL FILL ASSEMBLY WITH HINGED DOOR TO MATCH SCBA COMPARTMENTS

There shall be a cast aluminum fuel fill assembly furnished in the driver's side behind rear axle for the rear mount fuel tank. The fuel fill assembly shall consist of polished cast aluminum housing with a spring-loaded fill door. **The door shall be the same shape and configuration as the SCBA compartment doors.** The fill neck and cap assembly shall be located behind the spring-loaded door. The fill assemble shall drain on the backside of the body to prevent fuel from running down the exterior of the body.

One (1) Y__N__

FRONT MUD FLAPS

Heavy-duty, black colored, rubber mud flaps shall be furnished and installed behind the front wheels of the vehicle. Mud flaps shall extend the full width of the front tires and are to be attached with stainless steel fasteners.

One (1) Y__N__

REAR MUD FLAPS

Heavy-duty, black colored, rubber mud flaps shall be furnished and installed behind the rear wheels of the vehicle. Mud flaps shall extend the full width of the rear duals and are to be attached with stainless steel fasteners.

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One (1)

HORIZONTAL CHASSIS EXHAUST

Y__N__

The chassis exhaust system shall be extended to the front of the right rear wheel.

Three (3)

SCBA BRACKETS IN CAB

Y__N__

There shall be an SCBA bracket with collision restraint strap mounted in each chassis seating position as specified by the Fire Department.

One (1)

ALTERNATOR

Y__N__

The alternator shall be of adequate size to meet the NFPA requirements and to accommodate the specific apparatus electrical load.

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PUMP AND PLUMBING

One (1)

HALE QMAX-1500 GPM SINGLE STAGE FIRE PUMP

Y__N__

The centrifugal type fire pump shall be a Hale model QMAX midship mounted with a rated capacity of 1500 GPM. The pump shall meet NFPA 1901 requirements.

One (1)

SINGLE STAGE FIRE PUMP

Y__N__

The pump shall be a Hale QMAX designed to be mounted on the chassis rails of commercial and custom truck chassis, and have a capacity of gallons per minute rated performance.

At time of delivery pump shall be tested and rated as follows:

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

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

The pump shall be driven by a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance.

The entire pump, both suction and discharge passages shall be hydrostatically tested to a pressure of 600 psi. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. Pump shall be free from objectionable pulsation and vibration.

The pump body and related parts shall be of fine grain alloy cast iron, with minimum tensile strength of 30,000 psi. All moving parts in contact with water shall be of high quality bronze or stainless steel.

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

The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance.

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing to be located immediately adjacent to the impeller on side opposite the gearbox. 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 they shall be splash lubricated.

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

Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wraparound double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel, to be super-finished under packing with galvanic corrosion protection (zinc foil separators in packing) for longer shaft life. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

PUMP TRANSMISSION

The pump transmission shall be cast and completely manufactured and tested at the pump manufacturer's factory.

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

The transmission drive shafts shall be of heat-treated chrome nickel steel and at least 2 3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine in both road and pump operating conditions.

All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel, Bores shall be ground to size and teeth integrated, crown-shaved, and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load capability. An accurately cut spur design shall be provided to eliminate all possible end thrust.

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

The shift mechanism shall be of a heat treated, hard anodized aluminum air power cylinder, with stainless steel shaft. An in-cab control for rapid shift shall be provided that locks in road or pump.

With automatic transmissions, three green warning lights shall be provided to indicate to the operator when the pump has completed the shift from Road to Pump position. Two green lights to be located in the truck driving compartment and one green light on pump operator's panel adjacent to the throttle control. For manual transmissions, one green warning light will be provided in the driving compartment. All lights to have appropriate identification/instruction plates.

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PRIMING PUMP

The priming pump shall be a positive displacement vane type, electrically driven, and conform to standards outlined in NFPA Pamphlet No. 1901. One priming control shall both open the priming valve and start the priming motor.

One (1)

Y__N__

250 GPM PTO DRIVE FIRE PUMP

The pump shall be a Hale CBP series 250 GPM Fire Pump designed to be mounted on the chassis rails of commercial and custom truck chassis.

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

The pump shall be driven by a transmission mounted or split driveline power takeoff (PTO).

The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance.

The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2069 BAR). All moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

Pump body shall be vertically split, on a single plane, for easy removal of impeller assembly, including clearance rings.

Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

The pump shaft shall have only one mechanical seal. The mechanical seal shall be spring loaded, maintenance free and self-adjusting. (No exceptions.)

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

Impeller clearance rings shall be bronze, easily renewable without replacing impellers or pump volute body.

The pump shaft shall be electric furnace heat-treated corrosion resistant steel with a positive impeller lock. Pump shaft must be sealed with double lip oil seal to keep road dirt and water out of gearbox.

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The gearbox shall be cast, manufactured and tested at the pump manufacturer's factory.

Pump gearbox shall be of sufficient size to withstand the torque of the engine in pump operating conditions. The gearbox shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shaft shall be of heat-treated chromium steel and shall withstand the torque of the engine in pump operating conditions.

All gears shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated, crown-shaved and hardened, to give an extremely accurate gear for long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design shall be provided. (No exceptions.)

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

The PTO Pump & Roll pump system shall be plumbed to both crosslays, the front bumper discharge, and the rear 2-1/2" discharge.

One (1)

Y__N__

PNEUMATIC PUMP SHIFT

The pump shift shall be air operated and shall incorporate an air cylinder with an electric actuating switch to shift from road to pump and back.

The pump shift switch shall be mounted in the cab and identified as "Pump Shift" and include instructions permanently inscribed on the pump shift switch plate. The In-Cab operating switch uses a spring loaded lock to prevent it from accidentally being moved.

*A "Pump Engaged" indicator shall be provided in the driving compartment to indicate that the pump shift has been successfully completed.

*An "Ok to Pump" indicator shall be provided in the driving compartment to indicate that the pump is engaged, the chassis transmission is in pump gear, and the parking brake is engaged.

*A "Throttle Ready" indicator shall be provided at the pump operator's panel that indicates that the apparatus is in "OK to Pump" mode or that the chassis transmission is in neutral and the parking brake is engaged.

*An interlock system shall be provided to prevent advancement of the engine speed at the pump operators panel unless the chassis transmission is in neutral and the parking brake is engaged, or the apparatus is in "OK to Pump" mode.

*Controls for the pump shift are to be in the cab, and easily accessible.

One (1)

Y__N__

OILLESS PRIMER

The pump shall be furnished with the Hale ESP oil-less priming system.

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One (1) Y__N__

PACKING SEALS

The fire pump shall be provided with a manually adjusted pump packing seal. One only required on the suction, inboard, side of the pump. The packing seal shall be two inches in diameter and shall be adjustable. Packing seal shall be a split graphite-sealing ring with stainless steel separators.

One (1) Y__N__

CLASS ONE GOVERNOR

Class 1, pressure governor for electronic engines shall be furnished and installed on the apparatus. The system shall include an alpha/numeric display to show pump pressure and engine RPM. The control panel shall include a RPM/PSI mode switch, an on/off power switch, increase and decrease switches for throttle control, a preset switch to select preset pressure or RPM, and an idle switch to return to idle. The pressure governor shall be connected to the electronic engine and maintain the specified preset discharge pump pressure or a preset engine speed.

One (1) Y__N__

The device will be furnished, installed and tested by the apparatus body builder.

MANIFOLD DRAIN

A manifold drain valve shall be furnished with all pump drains connected to it so that the entire pump system may be drained by one control. Drain valve assembly shall consist of a stainless steel plunger and a bronze body.

One (1) Y__N__

A control handle is to be provided and located below the driver's side running board of the pump house, properly identified MASTER DRAIN.

UL TEST

One (1) Y__N__

The pump shall undergo an Underwriters Laboratories Incorporated test per Class A requirements of NFPA #1901 prior to delivery of the completed apparatus. The UL acceptance certificate shall be furnished with the apparatus on delivery.

ALTITUDE REQUIREMENTS

One (1) Y__N__

The apparatus shall be designed to meet the specified rating at 2000 feet altitude.

PUMP COOLING LINE

One (1) Y__N__

A 3/8" cooling line shall be installed to recirculate water from the pump back to the water tank, to cool the pump during pro-longed pumping operations. The cooling line shall be controlled at the operator's position with a quarter turn valve.

HEAT EXCHANGER DISCHARGE

A gated line shall be installed to provide water from the fire pump to the chassis supplied heat exchanger to assist in engine cooling during pumping operations. The heat exchanger line shall be controlled at the pump operator's panel.

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One (1)

FIRE PUMP WARRANTY

Y__N__

The Hale fire pump shall carry the manufacturer's two (2) year warranty covering defective parts and workmanship. A copy of the pump manufacturer's warranty policy shall be provided with the completed apparatus.

One (1)

PUMP SHIFT INDICATOR LIGHTS

Y__N__

Fire pump shall be driven by a heavy duty 10 bolt PTO capable of enough torque to operate the fire pump at rated capacity for continuous duty. The PTO shall be approved by Allison for this type of service. The PTO shall be of a "Hot Shift" style capable of either full capacity stationary pumping or pump and roll. Stationary pumping shall be done with chassis transmission in neutral. Pump engagement lights and safety interlock system for PTO driven pumps that are to be used for Stationary Pumping or Pump and Roll shall be as follows:

- A "Pump Engaged" indicator light shall be provided both in the driving compartment and on the pump operator's panel to indicate that the pump shift has been successfully completed.
- An "OK to Pump" indicator light shall be provided in the driving compartment to indicate that the pump is engaged, the chassis transmission is in neutral, and the parking brake is engaged. An "OK to Pump and Roll" indicator shall be provided in the driving compartment and shall be energized when the pump is engaged, the chassis transmission is in road gear, and the parking brake is released. When the "OK to Pump and Roll" indicator is energized, the "OK to Pump" shall not be energized.
- A "Throttle Ready" indicator shall be provided at the pump operator's panel that is energized when the "Ok to Pump" indicator is energized or when the chassis transmission is in neutral and the parking brake is engaged.
- An interlock system shall be provided to prevent advancement of the engine speed at the pump operators panel unless the chassis transmission is in neutral and the parking brake is engaged, or the apparatus is in "OK to Pump" mode.
- Controls for the pump shift are to be in the cab, and easily accessible.

One (1)

HALE PUMP INSTALLATION

Y__N__

The Hale fire pump shall be installed in conjunction with the body manufacturing process. Fire pump installation shall include installation of the fire pump, modification and/or fabrication of new drivelines and all pump-mounting brackets. All drivelines shall be spin balanced prior to final installation.

One (1)

INTAKE RELIEF VALVE

Y__N__

A 2-1/2" intake relief valve preset at 125 psi shall be permanently installed on the suction side of the fire pump. The valve shall have an adjustment range of 75 psi to 250 psi, and shall be designed to automatically self-restore to a non-relieving position when excessive pressure is no longer present.

Discharge side of the intake relief valve shall be plumbed to the right side below the running boards, away from the pump operator, and shall terminate with a 2-1/2" NST male chrome threaded adapter, marked with an engraved tag "Intake pressure relief outlet - Do Not Cap".

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One (1) Y__N__

DRIVER SIDE STEAMER INLET

There shall be one (1) steamer inlet furnished on the driver side of pump panel. The suction inlet shall have 6" NST thread. The suction inlet shall have a removable strainer provided inside the external inlet.

Steamer inlet to be as short as possible to allow suction fittings to be attached without extending past the side running boards.

One (1) Y__N__

PASSENGER SIDE STEAMER INLET

There shall be one (1) steamer inlet furnished on the passenger side of pump panel. The suction inlet shall have 6" NST thread. The suction inlet shall have a removable strainer provided inside the external inlet.

Steamer inlet to be as short as possible to allow suction fittings to be attached without extending past the side running boards.

One (1) Y__N__

SUCTION CAP DRIVER'S SIDE

The driver's side suction inlet shall be equipped with a chrome-plated, long handled, cap capable of withstanding 500 PSI.

One (1) Y__N__

SUCTION CAP PASSENGER SIDE

The passenger's side suction inlet shall be equipped with a chrome-plated, long handled, cap capable of withstanding 500 PSI.

One (1) Y__N__

2-1/2" GATED SUCTION INTAKE DRIVER SIDE

A 2-1/2" independent gated suction intake shall be provided on the driver's side pump panel. Intake shall be provided with a quarter-turn valve and control. The intake shall have a 3/4" drain valve with handle. Each intake shall have chrome-plated female swivel adapter with removable internal screen and a chrome-plated plug type cap with end chain.

One (1) Y__N__

SUCTION VALVE CONTROL

Suction valve shall have swing type control handle located adjacent to valve.

One (1) Y__N__

TRIM PANEL

A bolt on stainless steel trim panel shall be provided for easy access to the valve for repair or removal without removing the side panel on all intakes and discharges.

One (1) Y__N__

HOT DIP GALVANIZED DISCHARGE MANIFOLD

The discharge manifold shall be fabricated from heavy-duty tubular steel. The discharge manifold shall be fabricated, welded, all fittings attached and pressure tested prior to the galvanizing process. After testing the entire suction manifold shall be hot dip galvanized to minimize corrosion. The hot dip galvanized discharge

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manifold assembly shall be bolted to the pump and have stabilizer arms attached to reinforce the discharge manifold.

One (1) The hot dip galvanized manifold assembly shall have a ten (10) year warranty. Y__N__

PUMP DISCHARGES

Each gated discharge outlet shall include an Akron heavy-duty brass, quarter-turn, swing-out ball valve. All lines to have victaulic couplings or hose with stainless steel fittings installed where flex may occur to prevent cracking of the plumbing system. Each discharge shall have 3/4" cast bronze 1/4 turn drain valve complete with reinforced teflon seals, and blowout proof stem rated to 600 psi. A chrome-plated zinc handle shall be provided on each drain valve, complete with a 1" X 1 1/2" recessed identification label. Drains shall be aligned in a straight horizontal row at the lower edge of the corresponding pump panel so as to allow for ease of identification and operation. Each drain shall be labeled and numbered to correspond to the respective discharge outlet and coloring.

One (1) Individual discharge controls are to be aligned in a straight horizontal row across the pump operator's control panel, directly in-line with the corresponding discharge outlet line pressure gauges. Y__N__

GALVANIZED PLUMBING

Two (2) All rigid piping five-inch diameter or less shall be galvanized type with tapered thread or victaulic type couplings. Y__N__

DRIVER SIDE DISCHARGE OUTLET

Each 2-1/2" discharge outlet on the driver's side pump panel shall have a 2-1/2" quarter turn valve with control on pump operator's panel. There shall be a chrome plated 2-1/2" NST adapter that extends through the pump panel. Each discharge shall be provided with chrome-plated 30-degree discharge elbow.

Two (2) Two (2) 2-1/2" gated discharges shall be provided on the driver's side. Y__N__

MANUAL VALVE

Two (2) Discharge valve shall be swing-out type with manual control handle located on pump operator's panel. Y__N__

MANUAL DRAIN VALVE

One (1) The driver's side 2-1/2" discharge outlet shall have a 3/4" drain with individual control on side pump panel. Y__N__

PASSENGER SIDE DISCHARGE OUTLET

Each 2-1/2" discharge outlet on the passenger's side pump panel shall have a 2-1/2" quarter turn, swing-out valve with control on pump operator's panel. There shall be a chrome-plated 2-1/2" NST adapter that extends through the pump panel. Each discharge shall be provided with chrome-plated 30-degree discharge elbow.

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- One (1) One (1) 2-1/2" gated discharge shall be provided on the passenger's. Y__N__
MANUAL VALVE
- One (1) Discharge valve shall be swing-out type with manual control handle located on pump operator's panel. Y__N__
MANUAL DRAIN VALVE
- One (1) The passenger's side 2-1/2" discharge outlet shall have a 3/4" drain with individual control on side pump panel. Y__N__
DRIVER SIDE REAR DISCHARGE OUTLET
- One (1) There shall be one (1) 2-1/2" discharge outlet located on the driver's side rear of the body below the hose bed. The discharge outlet shall have a 2-1/2" quarter turn, swing-out valve with control on pump operator's panel. There shall be a chrome-plated 2-1/2" NST adapter that extends through the rear of the body. The discharge shall be provided with a chrome-plated 30-degree discharge elbow. Y__N__
MANUAL VALVE
- One (1) Discharge valve shall be swing-out type with manual control handle located on pump operator's panel. Y__N__
MANUAL DRAIN VALVE
- One (1) The driver's side rear 2-1/2" discharge outlet shall have a 3/4" drain with individual control on side pump panel. Y__N__
2-1/2" CAPS AND CHAINS
- One (1) The following discharge outlets shall be equipped with a 2-1/2" chrome-plated cap and chain. Y__N__
PASSENGER SIDE LDH OUTLET
- One (1) One (1) LDH discharge outlet on the passenger's side pump panel. The discharge outlet shall be plumbed with 3" I.D. pipe and quarter turn, swing out valve with control on pump operator's panel. The valve shall have a slow close device. The discharge shall extend through the pump panel. The discharge outlet shall terminate with a 3" NST male connection. Y__N__
MANUAL VALVE WITH SLOW CLOSE
- One (1) Discharge valve shall be three-inch (3") swing out type, with slow close and manual control handle located on pump operator's panel. Y__N__
MANUAL DRAIN VALVE
- The passenger's side LDH discharge outlet shall have a 3/4" drain with individual control on side pump panel.

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- One (1) **STORZ ADAPTER** Y__N__
- The following discharge outlets shall have a 3" NSTF x 5" Storz 30-degree drop adapter.
- The LDH discharge on the passenger's side pump panel shall have a 3"NSTF x 5" Stortz 30 elbow and blind cap.
- One (1) **1-1/2" FRONT DISCHARGE** Y__N__
- One and one half (1-1/2") discharge located at front bumper. Front discharge shall be plumbed using two-inch (2") pipe and wire reinforced high-pressure hose coupled with stainless steel fittings. Front discharge outlet shall have two-inch quarter turn swing out valve with control on pump operator's panel. The front discharge shall be provided with a 1-1/2" brass 90-degree swivel adapter with 1-1/2" NST male outlet.
- One (1) **MANUAL VALVE** Y__N__
- Discharge valve shall be swing out type with manual control handle located on pump operator's panel.
- One (1) **MANUAL DRAIN VALVE** Y__N__
- Front discharge outlet shall have a 3/4" drain with individual control on side pump panel. There shall be additional automatic drains furnished as required to drain the plumbing system between the pump and the front discharge connection.
- One (1) **FRONT DISCHARGE HOSE CONNECTION** Y__N__
- The hose connection for the front discharge outlet shall be located on top of the front bumper extension. The hose connection shall have a continuous swivel adapter located on top of the front bumper extension.
- One (1) **MONITOR PROVISION** Y__N__
- There shall be a three-inch (3") deluge discharge above fire pump. Deluge outlet shall be plumbed with 3" quarter turn, swing out valve and 3" I.D. pipe with 3" NPT male thread. The three-inch valve shall have a slow close device. Deluge outlet shall have control on pump operator's panel.
- One (1) **MANUAL VALVE WITH SLOW CLOSE** Y__N__
- Discharge valve shall be swing out type, with slow close and manual control handle located on pump operator's panel.
- One (1) **MANUAL DRAIN VALVE** Y__N__
- Monitor shall have a 3/4" drain with individual control on side pump panel.
- Two (2) **1-3/4" CROSSLAY(S) ASSEMBLY ABOVE PUMP** Y__N__
- Crosslay hose bed(s) shall be designed to carry 200 feet of 1-3/4" double jacket fire hose. Crosslay hose bed(s) shall be located above the fire pump. The floor of the

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crosslay hose bed(s) shall be perforated to allow for drainage. Polished stainless steel hose roller assemblies shall be provided at the sides and lower edges of the crosslay opening on each side of the apparatus body.

Two (2)

Crosslay discharge(s) shall be plumbed using rigid pipe or flexible high-pressure hose coupled with stainless steel fittings. The crosslay shall be provided with 2" brass valve, and a 2" 90 degree swivel adapter with 1-1/2" NST male outlet thread.

Y__N__

MANUAL VALVE

Each discharge valve shall be swing out type with manual control handle located on pump operator's panel.

Two (2)

Y__N__

MANUAL DRAIN VALVE

Each crosslay/speedlay shall have a 3/4" drain with individual control on side pump panel.

One (1)

Y__N__

DEADLAY ASSEMBLY ABOVE PUMP COMPARTMENT

The deadlay hose bed(s) shall be designed to carry 200 feet of 2-1/2" double jacket fire hose. Deadlay hose bed(s) shall be located above the forward transverse compartment. The floor of the deadlay hose bed(s) shall be perforated to allow for drainage. Polished stainless steel hose roller assemblies shall be provided at the sides and lower edges of the deadlay opening on each side of the apparatus body.

The floor of the hose bed shall be raised to allow room for the master pressure gauges to be located in the area below the hose bed.

The dead lay shall hold approximately 400' of 3" hose.

One (1)

Y__N__

CROSSLAY HOSEBED COVER

A .125 polished aluminum treadplate hinged cover shall be provided over the crosslay hose bed(s) complete with full length stainless steel piano hinge and with chrome plated lift handles provided on each side of the cover. Stops shall be provided to hold the cover in the open position or to protect cab or other adjacent body components. The hinge shall be located on the forward section of the cover, closest to the chassis cab.

One (1)

Y__N__

CROSSLAY END CAPS

A vinyl coated nylon cover shall be provided over each end of the crosslay hose bed. The vinyl end covers shall be held in place with velcro fasteners.

The color of the end flaps shall be red.

One (1)

Y__N__

FOAM SYSTEM

The apparatus shall be equipped with a FoamPro 2001, electronic, fully automatic, direct injection, discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrates and most Class B foam concentrates. The foam proportioning operation shall be based on direct measurement of water

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flows with no water flow restriction. The proportioning system shall meet NFPA Standards for foam proportioning systems and the design shall have passed testing against SAE automotive reliability standards appropriate for the application. The foam system shall be installed in accordance with the manufacturer's recommendations.

The system shall be equipped with a digital electronic control display, suitable for installation on the pump panel.

The digital computer control display shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:

1. Activate the foam system.
2. Provide foam concentrate proportioning rates from 0.1% to 3.0% in 0.1% increments.
3. From discharges plumbed after the paddlewheel type flow meter: show current flow in gpm, show total volume of water pumped, show total amounts of foam concentrate used.
4. Provide simulated flow for manual operation.
5. Perform setup and diagnostic functions.
6. Flash a "low concentrate" warning for two minutes when the foam concentrate tank(s) run low of concentrate.
6. Flash "no concentrate" warning if foam concentrate tank was not changed or foam concentrate was not added to the low tank and shut down foam concentrate pump.

The display shall have the capabilities when using a Hypro/FoamPro manual or electronic dual tank switching system of the following additional functions;

1. Display which foam concentrate tank is selected (tank A: PA or tank B: PB)
2. Separate default setting for foam concentrate injection rate.
3. Total amount of foam concentrate used from selected tank.
4. Dual foam concentrate foam pump calibration.

The foam system shall have a 12-volt 1/2-h.p. "TENV" electric motor designed for wet and high humidity environments, direct coupled to a positive displacement piston type foam concentrate pump with a rated capacity of .01 to 2.6 gpm with operating pressures up to 400 psi.

The foam injection system shall be plumbed to the onboard foam concentrate tank or tanks and to the discharge or discharges as specified.

The FoamPro system must be installed by a FoamPro Certified Dealer.

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One (1) The foam system shall be plumbed to both crosslays, the front bumper discharge, and the rear 2-1/2" discharge. Y__N__

SINGLE FOAM TANK PLUMBING SYSTEM

One (1) The foam tank shall be plumbed with three-quarter inch (3/4") valve and corrosion resistant hose from the foam tank to the foam inlet. There shall be a three-quarter inch (3/4") drain line furnished on the foam tank. Drain valve to be located on foam tank with corrosion resistant hose piped to below the frame level of the chassis. Y__N__

FOAM TANK

A 20-gallon foam concentrate tank shall be furnished as an integral component of the booster tank. The foam tank shall have a separate fill tower provided in a location to allow easy access for filling. Fill tower shall be equipped with a pressure/vacuum vent and have a sealed airtight cover. Tank shall be plumbed to the on board "Class A" foam system. A valved drain shall be provided at the lowest point of the foam tank. The drain shall be plumbed to drain directly to the surface below the apparatus without contacting other body or chassis components.

The following labels shall be attached to the foam tank:

One (1) "CLASS A FOAM TANK FILL"
"WARNING: DO NOT MIX BRANDS AND TYPES OF FOAM" Y__N__

TANK TO PUMP PLUMBING

A 3" *Akron* ball type gated suction valve shall be furnished from the tank to the pump, complete with a flexible connection and enclosed in the pump compartment.

A check valve shall be provided and installed in the line between the tank and the pump to prevent the possibility of backfilling the booster tank through the tank to pump suction line.

One (1) Tank suction shall be located in a sump assembly located below the bottom of the tank, properly baffled to prevent surging of water. A 3" cleanout plug shall be provided in the bottom of the tank sump. Y__N__

BALL VALVE TANK TO PTO PUMP

A 2-1/2" *Akron* ball type gated suction valve, operator's panel controlled, shall be furnished from the tank to the PTO pump, complete with a flexible connection and enclosed in the pump compartment.

A check valve shall be provided and installed in the line between the tank and the pump to prevent the possibility of backfilling the booster tank thru the tank to pump suction line.

Tank suction shall be located in a sump assembly located below the bottom of the tank, properly baffled to prevent surging of water. A 3" cleanout plug shall be provided in the bottom of the tank sump.

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One (1)

Y__N__

TANK FILL/COOLING LINE

A gated discharge line from the pressure side of the pump to the tank shall be furnished so the tank can be filled from draft or hydrant. Valve shall have control on the operator's panel. The valve is to be one and one-half inch, (1-1/2") swing out type ball valve and be plumbed to tank with flexible type hose.

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One (1)

Y__N__

POLY BOOSTER TANK

The booster tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity.

The transverse swash partitions shall be manufactured of polypropylene and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of polypropylene and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are welded to each other as well as to the walls of the tank.

A forward mounted sump shall be provided in the tank. The sump shall be constructed of polypropylene and be located in the left front quarter of the tank. A polypropylene pipe shall be installed that will sweep from the front of the tank to the sump location. The sump shall have a 3" N.P.T. threaded coupling on the bottom for a plug. This shall be used as a combination clean out and tank drain. An anti-swirl plate shall be located above the sump.

There shall be two standard tank outlets; one for tank-to-pump suction lines, and one for a tank fill line. All tank couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

One (1)

The tank shall carry a lifetime warranty from its manufacturer.

Y__N__

FILL TOWER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of polypropylene and with a minimum dimension of 8" x 14" outer perimeter. The fill tower shall be located in the left front corner of the tank. The fill tower shall have a polypropylene screen and a polypropylene hinged cover. Inside the fill tower, shall be fastened a combination vent overflow pipe. The vent overflow shall be polypropylene pipe that is designed to run through the tank and shall be piped behind the rear wheels.

One (1)

Y__N__

BOOSTER TANK

A 500-gallon capacity polypropylene booster tank shall be provided.

One (1)

Y__N__

HOT DIP GALVANIZED BOOSTER TANK SUBFRAME

The booster tank shall be mounted on a steel sub frame. Steel sub frame shall consist of two (2) longitudinal 3" x 4 pound channels and two (2) 3" x 4 pound channels welded together to form a tank retention cradle. The tank retention cradle shall prevent fore and aft, and side to side movement of the tank. Additional 3" x 4 pound transverse cross member channels shall be installed to support the floor of the booster tank. The cross members shall have a maximum spacing of 20" for the polypropylene tanks. There shall be an additional full-length longitudinal member

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installed in the center of the tank support area. The booster tank shall rest on heavy rubber channels that isolate the polypropylene tank from the sub frame.

One (1)

The booster tank sub frame shall be hot dip galvanized after fabrication.

Y__N__

DRIVER SIDE MOUNTED OPERATOR'S CONTROL PANEL

All pump suction and discharge controls are to be mounted on the driver side pump operator's panel so as to permit operation of the pump from a central location.

All of the pump controls shall be clearly identified with permanently engraved plate type labels.

A full panel width polished light hood with a minimum of three Weldon model 2025 light assemblies shall be provided to illuminate the entire pump operator's control panel.

An additional polished light hood with a minimum of two Weldon model 2025 light assemblies shall be provided to illuminate the right side pump panel. Lights shall be controlled by the operator's panel light switch.

GAUGE PANEL

All gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel, allowing access to the backside of all gauges and gauge lines. Panel is to include a stainless steel piano hinge, Hartwell HTL81 flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened.

One (1)

Y__N__

EXTRUDED ALUMINUM PUMP HOUSE STRUCTURE

The pump house structure shall be fabricated of extruded aluminum. The structure shall be welded together and have gusset plates on each corner. The pump house shall be mounted separate from the body and chassis and be bolted to the chassis frame rails.

One (1)

The exposed areas of the pump house structure shall be overlaid with polished aluminum treadplate.

Y__N__

PUMP PANEL PUMP ENGAGEMENT LIGHT

One (1)

One (1) light in the control panel light hood shall come on with a successful pump engagement. This shall be in addition to the "OK to Pump" light on the control panel.

Y__N__

PUMP PANELS

The right and left side pump panels shall be constructed entirely of 14-gauge type 304 brushed stainless steel material. The panels are to be completely "bolted" in place for ease of removal.

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One (1) Y__N__

PUMP COMPARTMENT ACCESS DOOR

The passenger's side pump panel shall be provided with a full panel width vertically hinged access door located in the upper portion of the side panel. This door shall be approximately 18" high and as wide as possible, and shall be constructed of polished aluminum treadplate. Two (2) flush mounted, push type latches shall be furnished to hold the door closed. The inspection door shall be attached with a stainless steel hinged and have a retainer cable attached to prevent the door from opening too far.

One (1) Y__N__

PUMP COMPARTMENT ACCESS PANEL

A removable access panel constructed of .125 aluminum treadplate material is to be provided at the front of the pump compartment, accessible when tilting the chassis cab. The access panel is to be flush mounted in the forward wall of the pump compartment. Door shall be a minimum of 60" wide by 25" high, and shall have easily accessible D-ring latch for quick removal.

One (1) Y__N__

DUNNAGE OVER PUMP

There shall be a dunnage compartment furnished above the pump. The dunnage compartment shall be as wide as possible from side to side, and be a minimum of 12" deep. The floor shall be bolted in place and removable for access to the pump.

One (1) Y__N__

RECESSED HOSEWELL IN DRIVER SIDE RUNNINGBOARD

A recessed hose well storage area shall be installed in the driver's side running board, below the main pump for storage of preconnected soft suction hose.

One (1) Y__N__

RECESSED HOSEWELL IN PASSENGER SIDE RUNNINGBOARD

A recessed hose well storage area shall be installed in the passenger's side running board, below the main pump for storage of preconnected soft suction hose.

One (1) Y__N__

PUMP OPERATORS PANEL

The following equipment shall be installed on the pump operator's panel.

One (1) Y__N__

MASTER GAUGES

Class One #LFP410, 4-1/2" diameter liquid filled pressure gauge registering up to 600-lbs per square inch with 1/4" pipe thread connection. The gauge shall be of the type that will not be injured when subjected to a vacuum. The gauge is to have a white face with black lettering. The gauge is to be located at the right of the gauge panel and labeled "DISCHARGE" with an engraved label.

Class One #LFP410, 4-1/2" diameter liquid filled compound gauge shall be provided on the suction side of the pump registering at least 600-lbs pressure and 30-inches of vacuum. The gauge shall have a white face with black lettering. The gauge is to be located to the left of the master discharge gauge and labeled "INTAKE" with an engraved label.

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- One (1) **PRESSURE GAUGES** Y__N__
- Class One #LFP220, 2-1/2" diameter liquid filled pressure gauges shall be provided. The gauges are to have white faces with black lettering. The gauges shall read -30 to 600 lbs. Line pressure gauges shall be individually identified with engraved labels.
- Individual line pressure gauges are to be mounted adjacent to the corresponding discharge valve control.
- Three (3) There shall be one (1) pressure gauge for each 1-1/2" discharge outlet. Y__N__
- Four (4) There shall be one (1) pressure gauge for each 2-1/2" discharge outlet. Y__N__
- One (1) There shall be one (1) pressure gauge for each deck gun outlet. Y__N__
- One (1) There shall be one (1) pressure gauge for each large diameter discharge outlet. Y__N__
- One (1) **CAB MOUNTED PRESSURE GAUGE** Y__N__
- A 2-1/2" Class I pressure gauge shall be mounted within the truck cab, within easy view of the driver, to monitor the pump pressure for Pump-And-Roll operation. Y__N__
- One (1) **CLASS ONE GOVERNOR**
- Class 1, pressure governor for electronic engines shall be furnished and installed on the apparatus. The system shall include an alpha/numeric display to show pump pressure and engine RPM. The control panel shall include a RPM/PSI mode switch, an on/off power switch, increase and decrease switches for throttle control, a preset switch to select preset pressure or RPM, and an idle switch to return to idle. The pressure governor shall be connected to the electronic engine and maintain the specified preset discharge pump pressure or a preset engine speed.
- The device will be furnished, installed and tested by the apparatus body builder.
- One (1) **INFORMATION CENTER** Y__N__
- A Class 1 Enfo IV master engine gauge and warning device shall be furnished and installed on the pump operator's panel. The Class 1 Enfo IV is equipped with super bright displays for maximum visibility during daytime hours. The device will monitor the following engine systems;
- Engine RPM display
 - System voltage display
 - Engine oil pressure display
 - Engine water temperature display
- One (1) **PUMP HOURMETER** Y__N__
- A pump hour meter shall be provided on the pump operator's panel.

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One (1) **PUMP PANEL IDENTIFICATION LABELS** Y__N__

All discharges shall be provided with color-coded labels. Identification labels shall be provided at the discharge control, the discharge outlet, and at the discharge drain valve control, color-coded according to NFPA recommended standards.

One (1) **PUMP PANEL WATER TANK LEVEL GAUGE** Y__N__

A Class One ITF Intelli-tank water tank level gauge shall be provided on the pump operator's panel. The Intelli-tank display features wide angle viewing and four (4) ultra-bright LED's for high visibility, even in direct sunlight. The Intelli-tank utilizes a pressure transducer, ILO of probes, to provide nine (9) accurate levels of indication.

One (1) **WATER TANK LEVEL GAUGE IN CHASSIS CAB** Y__N__

A Class One ITF Intelli-tank water tank level gauge shall be provided in the chassis cab. The Intelli-tank display features wide angle viewing and four (4) ultra-bright LED's for high visibility, even in direct sunlight. The Intelli-tank utilizes a pressure transducer, ILO of probes, to provide nine (9) accurate levels of indication.

One (1) **PUMP PANEL FOAM TANK LEVEL GAUGE** Y__N__

A Class One ITF Intelli-tank foam tank level gauge shall be provided on the pump operator's panel. The Intelli-tank display features wide angle viewing and ultra-bright LED's for high visibility, even in direct sunlight. The Intelli-tank utilizes a pressure transducer, ILO of probes, to provide nine (9) accurate levels of indication.

One (1) **UL TEST CONNECTIONS** Y__N__

A pump pressure and vacuum test block assembly shall be provided and mounted at the pump operator's control panel. The test block assembly shall include plug type caps.

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APPARATUS BODY SPECIFICATIONS

One (1)

HOSEBODY

Y__N__

The apparatus hose body is to be properly reinforced without the use of angles or structural shapes, and free from all projections that might injure the fire hose.

The main apparatus hose body shall run the full length of the apparatus body from behind the pump panel area to the rear face of the body.

The upper rear interior of the beavertail extrusions on the right and left side shall be overlaid with brushed stainless steel to protect the painted surface from damage by hose couplings

One (1)

HOSEBED CAPACITY

Y__N__

The hose bed will be configured to be 55 cubic feet, unless the desired hose load requires more area.

The hose bed shall hold the following amount of hose:

1000' of 5" hose
400' of 4" hose
400' of 2-1/2" hose

One (1)

HOSEBED FLOORING

Y__N__

Floors of the hose beds are to be provided with removable slat style extruded aluminum hose bed gratings, spaced 1/2" apart for proper hose ventilation. Hose bed gratings are easily lifted out of the main hose bed for access to the top of the specified booster water tank.

Two (2)

MAIN HOSEBED DIVIDER

Y__N__

Adjustable hose bed dividers shall be provided in the main hose bed.

The hose bed divider(s) shall be fabricated of 1/4" smooth aluminum sheet stock, welded into a "T" shaped aluminum extrusion for added strength along the bottom edge of the divider.

The divider shall be fully adjustable, mounted using aluminum "C" channel tracks at the front and rear of the divider for full side to side adjustment.

Two (2) hose bed dividers shall be provided.

One (1)

HINGED ALUMINUM HOSEBED COVERS

Y__N__

Polished aluminum treadplate hose bed covers shall be furnished, extending the full-length and width of the main hose bed.

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Covers shall be fabricated of polished aluminum treadplate with cross bracing for maximum strength, and to support the weight of a firefighter standing on the covers when closed. The covers shall be of the sloped design for proper water runoff. Each cover to be equipped with a full length stainless steel piano hinge with chrome plated grab handles at front and rear of each cover. Hose bed covers shall include heavy-duty stops to support them when in the opened position.

A hinged access door shall be provided for access to both the water and foam fill towers.

One (1)

Y__N__

REAR VINYL FLAPS FOR ALUMINUM COVER

There shall be a vinyl flap attached to each aluminum hose bed cover. The vinyl flaps shall cover the area on the rear of the hose bed from top to bottom. The flaps shall be independent of each other but attachable with velcro in the center. The bottom edge of the flap shall be weighted and also have an eyelet on each outer corner.

One (1)

The color of the rear vinyl flaps shall be red.

Y__N__

LIGHTS BELOW ALUMINUM HOSE BED COVER

There shall be two lights furnished below each hose bed cover. The lights shall switch on automatically when the hose bed cover is opened. The lights shall also be connected to the hazard light in the chassis cab to indicate when the hose bed covers are in the open position.

One (1)

Y__N__

BACKBOARD STORAGE FOR ALUMINUM COVER

There shall be storage for a backboard underneath the aluminum hose bed cover.

One (1)

Dimensions for the storage area shall be determined prior to construction.

Y__N__

LADDER MOUNTINGS

The ladders shall be mounted in a compartment, beside the water tank and below the hose bed, on individual poly scratch resistant slides. There shall be an aluminum treadplate door on the rear with push button latch for access to the interior of the compartment.

One (1)

Y__N__

GROUND LADDERS FURNISHED BY BODY BUILDER

The body builder shall furnish the ground ladders. See equipment section of this document for make and model of ladders.

Two (2)

Y__N__

ATTIC LADDER, PIKE POLE STORAGE COMPARTMENT

A compartment shall be provided to store the attic ladder and two (2) pike poles. The compartment shall be located in the hose bed area above the deep portion of the upper side compartments. There shall be an aluminum treadplate door on the rear with push button latch for access to the interior of the compartment.

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One (1)

Two (2) pike pole tubes shall be located in the storage compartment containing the attic ladder in the upper left corner of the hose bed.

Y__N__

ALUMINUM BODY

The body shall be fabricated of aluminum extrusions, smooth aluminum sheet and aluminum treadplate.

The aluminum extrusion alloy shall be 6061 with a temper rating of T6, and have a tensile strength of 45,000 PSI and yield strength of 40,000 pounds. The aluminum extrusions shall 3" x 3" aluminum tubing and specially designed extrusions where applicable.

The smooth aluminum sheet material alloy shall be 5052 with a temper rating of H32, and have a tensile strength of 33,000 PSI and yield strength of 28,000 pounds.

The aluminum treadplate alloy shall be 3003 with a temper rating of H22, and have a tensile strength of 30,000 PSI and yield strength of 28,000 pounds.

The extrusions shall be designed as structural-framing members with the smooth aluminum and treadplate fabricated to form compartments, hose beds, and floors. All aluminum material shall be welded together using the latest mig spray pulse arc welding system.

Compartments to be sweep out design and to be water and dust proof. All compartments shall be made to the maximum practical dimensions to provide maximum storage capacity.

All exterior compartments shall have polished aluminum drip moldings installed above the doors where necessary to prevent water from entering the compartments.

Wheel well panels shall be double break formed smooth aluminum that is welded in place. There shall be no visible bolt heads, retention nuts or fasteners on the exterior surface of the panel. To fully protect the wheel well area from road debris and to aid in cleaning, a full depth radius wheel well liner shall be provided. The frame side of the wheel well area on each side of the opening shall be attached to the frame side of the front and rear compartments. All seams on the frame side of the body shall be welded and caulked to prevent moisture from entering the compartments.

The rear wheel wells shall be radius cut for a streamlined appearance. A polished aluminum fenderette shall be furnished at each rear wheel well opening, held in place with stainless steel fasteners.

FASTENERS

All aluminum and stainless steel components shall be attached using stainless steel fasteners.

Compartment door hinges, handrails and running boards shall be attached using minimum 1/4" diameter machine bolt fasteners.

3/16" diameter fasteners shall only be used in nonstructural areas such as; door handles, trim moldings, gauge mounting, etc.

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One (1) **CS 1/8" ALUMINUM BODY** Y__N__

The aluminum sheet material used in fabricating the body shall be a minimum of .125 (1/8") in thickness.

One (1) **COMPARTMENT FLOORS** Y__N__

The compartment floors shall be constructed of smooth aluminum material, to match the compartment interior walls.

One (1) **BODY DIMENSIONS** Y__N__

Apparatus body shall be up to 144" long and 96" wide, reference drawing for actual body length. Body compartments shall be full depth from top to bottom. Each compartment shall be approximately twenty-three inches in depth. The hose bed shall be 54" wide.

One (1) **APPARATUS BODY SUB-FRAME** Y__N__

Passenger side upper compartment depth to be 13" deep

The apparatus body sub frame shall be constructed entirely of heavy steel structural channel material.

Two full frame lengths, three-inch (3") 4 pound per foot longitudinal steel channels shall form the sides of the body sub frame and sides of the water tank cradle. Sub frame cross members shall be fabricated with three inch (3") 4 pound per foot heavy steel channel cross members welded to the longitudinal body sub frame sides and the full length frame pads.

Two full frame length 1/2" x 3" flat steel frame pads shall be attached to the body sub frame and rest on top of the chassis frame rails for proper frame weight distribution.

The steel frame pads, longitudinal steel channels and sub frame cross members shall be attached to the chassis frame rails using heavy "U" bolt fasteners to allow removal of the sub frame and body assembly from the chassis. There shall be a barrier provided between the sub frame and body to prevent electrolysis.

The rear sub frame and lower body platform support members shall be of the "two piece" design, fabricated of 4.3 lb. Per foot heavy channel and welded to the full length sub frame channel liners at the rear.

A minimum of two rear platform support channels shall be provided and constructed of 4.3 lb. Per foot heavy steel material. Each support channel shall have welded in gusset where the support meets the rear sub frame rails.

After fabrication the entire sub frame assembly shall be hot dip galvanized to prevent corrosion. The hot dip galvanized sub frame shall have a lifetime warranty.

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One (1) Y__N__

COMPARTMENT VENTS

All body compartments shall have a minimum of one (1) louvered panel bolted into a wall to provide the proper airflow inside the compartment. There shall be a filter installed behind the louvered panel. The filter shall be accessible for cleaning by removing the louvered panel on the interior of the compartment.

One (1) Y__N__

BODY AND PUMP HOUSE FLEX JOINT

When equipped with a fire pump, the body and pump house shall be a separate freestanding component forming a true flex joint between the body and pump house. The intent is to allow either to be easily removed as a single unit without disturbing the other and to provide a flex joint between the two modules. Designs where the pump house and body are interjoined as a common unit do not meet the technical requirement of providing a flex joint or the repairability requirement of these specifications.

One (1) Y__N__

WHEEL WELL LINER AND FENDERETTES

For ease of accessibility and maintenance, wheel well panels shall be double break formed painted smooth plate that is welded in place.

To fully protect the wheel well area from road debris and to aid in cleaning, a full depth (minimum of 25") radius wheel well liner shall be provided. Wheel well liner shall be smooth aluminum to prevent corrosion.

The rear wheel wells shall be radius cut for a streamlined appearance. A polished aluminum fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners.

One (1) Y__N__

REAR TOW EYES

There shall be two tow eyes furnished under the rear of the body and attached directly to each chassis frame rail. There shall be a reinforcement spreader bar connecting the two tow eyes. Tow eyes are to be constructed of 3/8" plate steel with a 4" I.D. hole, large enough for passing through a tow chain end hook.

One (1) Y__N__

APPARATUS COMPARTMENTATION

There shall be large enclosed compartments on both sides of the body, starting at the front of the hose body and continuing to the rear of the apparatus. These compartments shall be as large as possible, using all available space.

The aluminum treadplate compartmentation tops on each side of the body shall be extended out and downwards a minimum of .50" over the compartment doors forming a drip rail. Corners shall be TIG welded.

Lower or rear face compartments, if specified shall be provided with polished aluminum drip rails.

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One (1)

Y__N__

HINGED COMPARTMENT DOOR CONSTRUCTION

Any hinged compartment doors shall be of the flush style so that the entire door fits flush against the apparatus body sides. The doors shall be designed, in the closed position, to have the painted edges protected from damage on the tops by forming the treadplate compartment tops into a extended drip edge, on the bottoms by the rub rail.

The doors shall be a minimum 2" thick, fabricated of a minimum of .125 smooth aluminum. Full panel inner compartment door liners shall be provided and constructed of smooth aluminum. The compartment doors shall have a foam panel glued in place between the exterior and interior door skin. Exterior door panels shall be smooth with no welds visible on the exterior skin. Double door compartments shall be equipped with a secondary latch to hold the secondary door in position.

All compartment door hinges shall be full-length piano type constructed of a minimum 14-gauge type 304 polished stainless steel with 3/16" stainless steel hinge pin with dual directional bolt holes for ease of adjustment.

When horizontally hinged lift-up doors are specified, they shall be equipped with heavy-duty gas filled props to hold the doors in the open position. All other hinged doors shall be equipped with spring loaded hold open device specifically designed for use on vertically hinged doors. Door holders shall be bolted in position. The door ajar switches shall be fully enclosed within structural members and shall not extend into the clear door opening.

All compartment doors shall be provided with hollow core weather stripping to provide a weather tight seal at the door opening and to prevent road spray and debris from entering the compartment.

COMPARTMENT ROLL-UP DOOR CONSTRUCTION

Any exterior side equipment compartments so specified shall be equipped with roll-up shutter doors to be installed as specified herein.

The drum assembly shall be fully enclosed and protected from the elements. Pendant plates supporting the door roll assembly shall be bolted in place, adjustable and capable of being removed with common hand tools. Pendant plates and supports that are welded in place do not meet the maintenance and service criteria of these specifications.

One (1)

Y__N__

NATURAL FINISH ROLL UP DOORS

The roll-up doors on each side of the apparatus body shall be natural finish aluminum.

One (1)

Y__N__

EXTERIOR DOOR LATCHES

Side exterior compartment doors shall be furnished with a large stainless steel spring loaded D-handle with slam type latches. D-handles shall have the large "bent" D-ring for ease of grabbing the handle even when wearing mitts or gloves.

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One (1) A non-moisture absorbing gasket shall be installed between the door latch and the door skin panel. Y__N__

ROLL UP DOORS

One (1) R.O.M. Robinson brand extruded aluminum shutter style doors with lift bar latch mechanisms and associated hardware shall be provided and installed as specified. Y__N__

DRIVER SIDE COMPARTMENTS

Three body compartments shall be furnished as follows:

- One compartment ahead of the rear wheels with full height double hinged doors.
- One compartment above rear wheels with double hinged doors.
- One compartment behind the rear wheels with full height double hinged doors.

One (1) Y__N__

PASSENGER SIDE COMPARTMENTS

Three body compartments shall be furnished as follows:

- One compartment ahead of the rear wheels with full height double hinged doors.
- One compartment above rear wheel with one lift-up door.
- One compartment behind the rear wheels with full height double hinged doors.

One (1) Y__N__

REAR BODY CONFIGURATION

Rear apparatus body compartments shall be as follows:

- There shall be one lower compartment with roll-up door.

One (1) Y__N__

REAR BEAVER TAIL

There shall be a beaver tail on the rear of the body. The beaver tail shall angle down from the top of the hose bed to the rear step area. Polished aluminum tread bright shall be installed on the inside of the beaver tail.

Six (6) Y__N__

ADJUSTABLE SHELVES

Compartment shelves shall be constructed of .125" smooth Aluminum. Shelves shall have formed edges on three sides for added strength. Shelves shall be fully adjustable, with extruded aluminum unistrut channels provided on the front and rear compartment walls.

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Six (6) adjustable shelves shall be provided and located as follows:

- Two (2) in the compartment in front of the rear wheels on the driver's side, (L1),
- Two (2) in the compartment behind the rear wheels on the driver's side, (L3),
- One (1) in the compartment in front of the rear wheels on the passenger's side, (R1),
- One (1) in the compartment in behind the rear wheels on the passenger's side, (R1),

Five (5)

Y__N__

SLIDE-OUT TRAY

Slide-out trays shall be constructed of 3/16" aluminum material. Trays shall have with heavy-duty roller bearing slides with a latch to hold the tray in the "open" and "closed" positions. Tray shall have capacity of 250 pounds.

Five (5) slide-out trays shall be provided as follows:

- One (1) adjustable slide-out tray in the compartment in front of the rear wheels on the driver's side (L1) below the adjustable shelves,
- One (1) floor mounted in the compartment behind the rear wheels on the driver's side (L3),
- One (1) floor mounted in the compartment in front of the rear wheels on the passenger's side (R1),
- One (1) floor mounted in the compartment behind the rear wheels on the passenger's side (R3),
- One (1) floor mounted in the rear compartment.

One (1)

Y__N__

ROLL-OUT AND DOWN EQUIPMENT TRAY

Roll-out and down type equipment tray shall be provided. Each roll-out and down tray shall be constructed of formed .125" aluminum and have extruded aluminum guide tracks on each side. The extrusion shall include a specially sized channel at both sides of the drawer for the installation of two (2) high quality stainless steel ball bearing rollers. These bearings shall provide support of the outside front of the tray. A second set of stainless steel ball bearing rollers shall be provided for the inside rear of the tray. These rollers shall be bolted to the rear of the drawer and shall slide on two (2) extruded aluminum tracks that are angled to provide an out and down action of the tray. Mounting of the drawer slide mechanisms shall be to the specified shelf tracks to allow for future adjustment and removal.

- One (1) roll-out and down tray shall be provided in the compartment over the rear wheels on the driver's side (L2).

One (1)

Y__N__

DRIVER SIDE AIR BOTTLE COMPARTMENTS IN WHEELWELL

SCBA storage compartment shall be provided and located in the driver side rear wheel well of the apparatus body. Compartment door and frame shall be constructed entirely of cast aluminum and have hinged style door. The compartment bottom and rear wall shall be lined with rubber material to protect paint finish of the air cylinder.

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- Two (2) One (1) SCBA compartment shall be provided on the driver's side. Y__N__
- PASSENGER SIDE AIR BOTTLE COMPARTMENTS IN WHEELWELL**
- SCBA storage compartment shall be provided and located in the passenger side rear wheel well of the apparatus body. Compartment door and frame shall be constructed entirely of cast aluminum and have hinged style door. The compartment bottom and rear wall shall be lined with rubber material to protect paint finish of the air cylinder.
- Four (4) Two (2) SCBA compartments shall be provided on the passenger's side. Y__N__
- SCBA BRACKETS**
- SCBA mounting bracket(s) shall be provided and mounted in the enclosed storage compartments as per instructions of Fire Department.
- One (1) Four (4) SCBA brackets shall be provided and mounted to Unistrut channels in the compartment over the rear wheels on the passenger's side of the body (R2). Y__N__
- EXTRUDED ALUMINUM RUB RAILS**
- Full body length polished aluminum rub rails shall be bolted in place on the right and left body sides and in the pump panel area. The rub rails shall extend outward beyond the body sides for protection of the compartments and doors. There shall be a bolt on aluminum corner casting on each rear corner to blend the rear tailboard assembly with the side rub rails.
- One (1) The side rub rails shall be a heavy extruded aluminum "C" channel. Y__N__
- SIDE AND REAR OVERLAYS**
- Overlay panels shall be constructed of 3003 polished aluminum treadplate. Polished aluminum overlay shall be provided and installed in the following areas:
- The front face of each side compartment.
 - The rear body face and vertical area above tailboard and below hose bed.
 - Driver's side and passenger compartment top extending down over side to the compartment doors then forming a drip rail above doors.
 - Front face of hose bed above booster tank.
- One (1) Overlay shall be installed with "Aluminized" stainless steel bolts to prevent corrosion. Y__N__
- POLISHED COMPARTMENT TOP WELDS:**
- One (1) The compartment top welds to be polished. Y__N__
- SLIP-RESISTANT WALKWAY SURFACE**
- All exterior surfaces designated as stepping, standing, and walking areas shall have an aluminum slip-resistant overlay material installed. The slip-resistant overlay

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material shall have a raised serrated surface that will allow moisture to drain out either side. The recessed surface shall be one piece solid material to prevent road spray and debris from entering the top surface from below. The slip-resistant overlay material shall meet the requirements of NFPA 13-7.3. The slip-resistant surface shall be installed in the following areas of the apparatus body:

- Step areas of the side running boards.
- Rear step running board step.
- Walkway and standing platforms

One (1)

REAR STEP/RUNNING BOARDS

Y__N__

The apparatus body running boards and rear step shall be constructed with slip-resistant surface and shall have bright aluminum treadplate trim around the outside edges. Side running boards and rear step shall be removable for ease of service in case of damage.

One (1)

REAR STEP/TAILBOARD

Y__N__

A single piece .188 rear step/tailboard shall be furnished that is a minimum of 18.00" deep and full width of the apparatus body, from rub rail to rub rail. The tailboard shall be provided with a removable casting on each corner for a pleasing appearance.

One (1)

HANDRAILS

Y__N__

Access handrails shall be 1 1/4" in diameter extruded aluminum with rubber insert. Access rail escutcheons and brackets shall be chrome plated and attached with stainless steel bolts. Anchoring of posts and framing members for railings of all types shall be of such construction that the completed railing structure shall be capable of withstanding a load of at least 225 pounds applied in any direction at any point along the rail.

One (1)

REAR HANDRAILS

Y__N__

Two (2) vertical access handrails shall be provided and mounted on the rear of the apparatus body, one on each side. Each rear handrail to be approximately 48" long.

One (1)

HANDRAILS

Y__N__

A full width access rail is to be provided and installed across the rear face of the apparatus body, below the hose bed level above the rear compartment doors.

One (1)

HANDRAILS

Y__N__

An access rail shall be provided and installed on the upper section of the right side pump house.

One (1)

HANDRAILS

Y__N__

An access rail shall be provided and installed on the upper section of the left side pump house.

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Ten (10)

Y__N__

FOLDING ACCESS STEPS

NFPA approved folding steps shall be provided and mounted on the apparatus. All access steps shall have a minimum surface area of 35-square inches, and have a slip-resistant standing surface. The step shall be capable of supporting a 500-lb. load.

Ten (10) folding steps shall be provided and located as follows:

- Three (3) on the front face of the compartments on the driver's side,
- Three (3) on the front face of the compartments on the passenger's side,
- Four (4) at the rear of the body.

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One (1) Y__N__

ELECTRICAL

Electrical wiring, hydraulic lines, air system tubing, and control cables shall be fastened to the frame or body structure of the apparatus and shall be furnished with protective looms, grommets, or other devices, so that any such connector and/or wiring will be protected from shear or tear.

The body 12-Volt electrical system shall be designed specifically for the apparatus body. Automatic reset circuit breakers shall be provided and installed in all circuits.

Wiring data shall be provided with the completed apparatus.

One (1) Y__N__

The following electrical equipment and lights shall be provided and installed:

WIRING SYSTEM

All electrical wiring shall be 14-gauge heavy strand copper with type GXL crosslink high temperature insulation, being circuit function printed every three-inches along its entire length.

Wiring data shall be provided with the completed apparatus.

One (1) Y__N__

The following electrical equipment and lights shall be provided and installed:

TAIL & STOP LIGHTS

Two (2) Weldon #2010 rectangular red stop/tail lights shall be provided and mounted at the rear of the body, one on each side.

One (1) Y__N__

DIRECTIONAL LIGHTS WELDON 2010

Two (2) Weldon #2010, rectangular amber directional signal lights with black arrows shall be provided and mounted at the rear of the body, one on each side below the stop/tail lights.

One (1) Y__N__

BACKUP LIGHTS WELDON 2010 (RECT)

Two (2) Weldon #2010, rectangular clear backup lights shall be provided and mounted, one on each side at the rear of the body. The backup lights shall be mounted below the rear stop/tail and directional lights.

One (1) Y__N__

TAIL LIGHT TRIM

A polished cast aluminum three hole taillight bezel/housing shall be provided. The specified rear lighting units shall be installed in the bezel/housing and secured. The completed assembly is to be bolted to the apparatus body, one each side.

One (1) Y__N__

CLEARANCE LIGHTS

There shall be clearance marker lights installed meeting all DOT requirements. The vehicle clearance lights shall be recess mounted within the rear center tailboard step.

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- One (1) **LICENSE PLATE BRACKET** Y__N__
- A license plate mounting bracket shall be provided complete with a chrome-plated shielded indirect type light. Bracket shall be mounted at the rear of the apparatus body.
- One (1) **BACK UP ALARM** Y__N__
- Back up alarm to be furnished with chassis.
- One (1) **LOAD MANAGER** Y__N__
- The apparatus shall be equipped with a Class 1 Total System Manager (TSM) for performing electrical load management. The TSM shall be supplied with the custom chassis.
- Twelve (12) **COMPARTMENT LIGHTING** Y__N__
- All side and rear exterior equipment compartments shall be provided with one (1) clear compartment light mounted to the top of the compartment ceiling. Compartment lights shall switch on automatically when the compartment door is opened and switch off when the door is closed.
- Two (2) **COMPARTMENT LIGHTING** Y__N__
- Two (2) compartment lights shall be provided in each side compartment.
- Two (2) **COMPARTMENT LIGHTING** Y__N__
- All side and rear exterior equipment compartments shall be provided with one (1) clear compartment light mounted to the side walls of the compartment. Compartment lights shall switch on automatically when the compartment door is opened and switch off when the door is closed.
- One (1) **OPEN COMPARTMENT/HAZARD WARNING LIGHT** Y__N__
- Two (2) compartment lights shall be provided in the rear compartment.
- One (1) **BATTERY DISCONNECT SWITCH** Y__N__
- A red flashing, warning light shall be supplied with the chassis.
- One (1) **BATTERY DISCONNECT SWITCH** Y__N__
- A master battery on/off switch shall be furnished by the chassis manufacturer and mounted in a convenient location to the driver. The master battery switch shall disconnect the batteries from all chassis and body accessories.
- One (1) **DASH MOUNTED EMERGENCY ELECTRICAL SWITCH PANEL** Y__N__
- An electrical switch panel shall be designed and mounted in the cab dash area as furnished by the custom chassis manufacturer. All switches shall be provided with back lighted snap-in legend inserts.

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SWITCHES

All emergency light switches shall be lighted, rocker style. Switches shall be internally lit when the switch circuit is in the on position. A plug-in identification label is to be provided and installed adjacent to each rocker switch with backlighting provided behind the label.

An internally lighted switch shall be provided and wired through a heavy-duty relay to activate power to the emergency lights. The emergency lights shall be activated by a single "MASTER SWITCH" on the electrical console.

One (1)

Y__N__

SPOTLIGHT

One high intensity hand held spotlight shall be provided and mounted in the chassis cab on the passenger side and wired to the chassis 12-volt system. Spotlight shall be "Blue Eye" type.

Exact location shall be determined prior to construction.

One (1)

Y__N__

REAR STEP LIGHTS

Two (2) chrome plated lights shall be furnished and installed on the rear face of the body to illuminate the rear step area. Lights shall be wired to the panel light switch at the pump operator's panel.

One (1)

Y__N__

ENGINE COMPARTMENT WORK LIGHT

An engine compartment work light shall be provided complete with a switch mounted on the light head.

One (1)

Y__N__

PUMP COMPARTMENT WORK LIGHT

A pump compartment work light shall be provided and installed within the pump compartment area complete with a switch mounted on the light head.

One (1)

Y__N__

UNDER CAB LIGHTING

The under cab lights shall be supplied with the chassis.

One (1)

Y__N__

UNDER BODY LIGHTING

There shall be two (2) lights furnished below the pump house running board, one on each side. The lights shall be wired to turn on and off with a switch located on the pump operator's panel.

One (1)

Y__N__

UNDER BODY LIGHTING REAR STEP

There shall be two (2) lights furnished below the rear step, one on each side. The lights shall be wired to turn on and off with a switch located on the pump operator's panel.

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One (1) **REAR DECK LIGHTS** Y__N__

Two (2) Unity #AG series, chrome-plated, six-inch rear mounted lights with swivel type mounting bracket and individual switches shall be provided.

One light shall be a **35-watt 75,000 candlepower spot** lamp, and one light shall be a **35-watt 1,100 candlepower flood** lamp.

Two (2) **TELESCOPING 12 VOLT SPOT/FLOODLIGHTS** Y__N__

Fire Research 12-volt spot/flood light Model LTA530-TC shall be provided and mounted on a side mount/bottom raise type telescopic pole. The light shall be mounted on the rear of the cab. The lights shall be wired to the chassis 12-volt system with a switch provided on the light.

Two (2) telescoping lights shall be provided, one each side and mounted to the back of the cab.

Two (2) **REAR SCENE LIGHT** Y__N__

There shall be a Weldon Model 2010, 12-volt 50-watt Scenelight provided and mounted at the rear of the body. Light shall be mounted on an 18-degree downward angled, polished aluminum casting. The light shall be wired through a switch in the chassis cab and be labeled "Rear Scene Light".

Two (2) scene lights shall be provided and mounted above the tail lights, one each side.

One (1) **DRIVER SIDE SCENE LIGHT** Y__N__

There shall be a Weldon Model 2010, 12-volt 50-watt Scenelight provided and mounted on the driver side of the cab. Light shall be mounted on an 18-degree downward angled, polished aluminum casting. The light shall be wired through a switch in the chassis cab and be labeled "Driver's Side Scene Light".

One (1) **PASSENGER SIDE SCENE LIGHT** Y__N__

There shall be a Weldon Model 2010, 12-volt 50-watt Scenelight provided and mounted on the passenger side of the cab. Light shall be mounted on an 18-degree downward angled, polished aluminum casting. The light shall be wired through a switch in the chassis cab and be labeled "Passenger's Side Scene Light".

One (1) **TRAFFIC DIRECTION BAR** Y__N__

A Code 3, Model AS-10S, 47" ten-lamp Arrowstik traffic direction light shall be provided and installed facing the rear of the apparatus with the control head mounted in the truck cab.

One (1) **RECESS MOUNTED TRAFFIC ADVISOR** Y__N__

The traffic advisor shall be recess mounted into the rear of the apparatus body.

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One (1)	AIR HORNS	Y__N__
	Two (2) chrome-plated Grover "Stuttertone" air horns shall be provided and recess mounted in the front bumper extension. A pressure protection valve to prevent the use of air horns or other air operated accessories when the system air pressure drops below 80 psi shall be provided.	
	Air horns shall be controlled from the following switch positions.	
One (1)	One (1) foot switch shall be provided on the driver's side floor for activation of the air horn.	Y__N__
One (1)	One (1) foot switch shall be provided on the passenger's side floor for activation of the air horn.	Y__N__
One (1)		Y__N__
	MECHANICAL SIREN	
	A Federal model Q2B electro-mechanical siren shall be furnished with mounting rigidly reinforced. Siren controls and siren brake shall be accessible from the following switch control location.	
One (1)	One (1) foot switch shall be provided on the driver side floor for activation of the Q2B siren.	Y__N__
One (1)	One (1) foot switch shall be provided on the passenger side floor for activation of the Q2B siren.	Y__N__
One (1)		Y__N__
	Q2B SIREN BRAKE SWITCH	
	There shall be a momentary switch installed on the operator's switch console to activate the Q2B siren brake.	
One (1)		Y__N__
	Q2B MOUNTING LOCATION	
	The Q2B shall be located on the front bumper extension.	
One (1)		Y__N__
	Q2B MOUNTING LOCATION	
	The Q2B shall be located on the front bumper extension.	
One (1)		Y__N__
	ELECTRONIC SIREN	
	A Code 3 Model 3692 V-CON, 200-watt electronic siren with Hi-Lo and hardwired microphone shall be provided and mounted in the cab.	
One (1)		Y__N__
	SPEAKER	
	DYNAMAX, 100-watt speaker shall be provided and recess mounted in the front bumper of the chassis. The speaker shall be connected to the electronic siren control unit.	

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One (1)	<p>OPTICOM</p> <p>A 3M "Opticom" signaling device shall be provided and installed on the cab roof. Control switch shall be provided on the chassis electrical module. The "Opticom" shall be turned off when the park brake is set.</p>	Y__N__
One (1)	<p>HEADLIGHT FLASHER</p> <p>The headlight circuit of the chassis shall be provided with a heavy-duty headlight flasher system designed for emergency vehicles. Flasher shall include override for high beam headlights and controlled by switch located on the electrical module in the chassis cab. Headlight flasher to be turned off when the park brake is set.</p>	Y__N__
One (1)	<p>RADIO ANTENNA</p> <p>There shall be a universal base for the radio antenna installed on the chassis cab roof. The power and ground wires for the radio shall also be installed.</p>	Y__N__
One (1)	<p>EMERGENCY LIGHTING</p> <p>The upper and lower zones "A", "B", "C", "D" of the apparatus shall have the following emergency lighting equipment:</p>	Y__N__
One (1)	<p>LIGHT BAR</p> <p>One (1) Code 3 model 556A3 56" mounted on chassis cab roof to meet the NFPA upper zone A lighting requirement. Light bar to have the following equipment.</p> <ul style="list-style-type: none">· (4) 50-watt standard rotators· (1) 50-watt fast rotator· (2) diamond mirrors· (2) 2-step cascade mirrors <p>The light bar shall also contain two alley lights with individual switches in the cab and a steady burning forward facing red light to meet California DMV requirements.</p>	Y__N__
One (1)	<p>REAR LIGHTS</p> <p>Two (2) Code 3 model 550F rotating lights mounted on the rear of the apparatus body to meet the NFPA Zone B, C, D upper level lighting requirement. The lights shall be activated through the master emergency light switch located on the electrical console. Each light to have the following equipment.</p> <ul style="list-style-type: none">· (1) 50-watt fast rotator· 1 Red lens / 1 Amber lens	Y__N__
One (1)	<p>UPPER ZONE "B, C, D" LIGHT MOUNTING</p> <p>The upper rear lights designated for Upper Zone "B" shall be mounted on cast aluminum stanchions attached to the apparatus body, one on each side.</p>	Y__N__

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One (1)

ZONE A FRONT LIGHTS

Y__N__

There shall be two (2) Code 3 model 40 strobe lights furnished on the front grill to meet the NFPA Zone A lower level lighting requirement. The strobe lights shall be connected to a power supply and be activated through the master emergency light switch located on the electrical console.

One (1)

ZONE B & D SIDE LIGHTS

Y__N__

There shall be three (3) Code 3 model 40BZ strobe lights with bezels furnished on each side of the apparatus to meet the NFPA Zone B & D lower level lighting requirement. One light mounted as far forward as possible, one light mounted as far to the rear as possible, and one light mounted between the front and rear lights. The lights shall be connected to a power supply and be activated through the master emergency light switch located on the electrical console.

One (1)

ZONE C REAR LIGHTS

Y__N__

There shall be two (2) Code 3 model 80BZ strobe lights with bezel furnished on the rear of the apparatus to meet the NFPA Zone C lower level lighting requirement. The strobe lights shall be connected to a power supply and be activated through the master emergency light switch located on the electrical console.

One (1)

12 VOLT ELECTRICAL CERTIFICATION

Y__N__

The low voltage electrical system shall be tested and certified per NFPA 1901 requirements.

A certificate of compliance shall be provided with the completed vehicle upon delivery.

Minimum electrical load consists of the total amperage required to simultaneously operate the following in a stationary mode at the incident scene.

- The propulsion engine and transmission.
- All Clearance and marker lights.
- The communication radio. (Default of 5.0 amps used for testing).
- Illumination of all walking surfaces, the ground at all egress points, controls and instrument panels and 50% of the total compartment lighting load.
- Minimum warning lights required for "Blocking Right of Way" mode.
- The current to simultaneously operate any fire pump, aerial device & hydraulic pumps.
- Anything defined by the purchaser to be critical to the mission of the apparatus.

The first test for the electrical system is the **Reserve Capacity Test**. All the above listed components operate with the engine shut off. After 10 minutes all electrical loads are shut off and the battery system must have adequate reserve power to start the engine.

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The second test is the **Alternator Performance Test at Idle**. All the above listed components operate with the engine at an idle. There can be no current draw from the batteries of the apparatus.

The third test is the **Alternator Performance Test at Full Load**. All electrical components shall be activated with the engine operating at governed RPM for two hours. During the test the system voltage can not drop below 11.7-volts or have excessive battery discharge for more than 120 seconds. Any loads not listed in the minimum electrical load may be load managed in order to pass the test.

All of the above tests must be conducted with the engine compartment at approximately 200 degrees.

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One (1)

Y__N__

PAINTING

All bright metal fittings if unavailable in stainless steel shall be heavily chrome-plated. Iron fittings shall be copper plated prior to chrome plating.

All seams shall be caulked both inside and along the exterior edges with an automotive sealant to prevent moisture from entering between any body panels.

The body and all parts shall be thoroughly washed with grease cutting solvents prior to any sanding. After the body has been sanded and the minor imperfections filled and sanded, the body shall be washed again with a solution to remove any contaminants on the surface. The first coating to be applied is a self-etching primer for maximum adhesion to the body metal. The next three coats shall be an acrylic, urethane, primer surfacer. The primer surfacer coat is to be hand sanded with 600-grit sandpaper to insure maximum gloss of the paint. The last step is the application of at least three coats of Concept Acrylic Urethane two component color.

The fire pump and all rigid discharge and suction plumbing shall be painted silver in color.

While constructing the truck body, all aluminum parts shall be properly fitted on the body. The backside of all aluminum parts shall be sanded smooth of any burrs and sharp edges.

All aluminum parts shall be bolted to the body using stainless steel fasteners. Cadmium plated fasteners are not acceptable.

During reassembly of the apparatus, care shall be exercised in fitting and fastening the parts back in their respective position on the vehicle.

One (1)

Y__N__

NATURAL FINISH ROLL UP DOORS

The roll-up doors on each side of the apparatus body shall be a natural finish aluminum.

One (1)

Y__N__

UNDERCOATING

The body sub frame shall be undercoated with a heavy-duty automotive type undercoating before the rubber backing and the compartments are attached. After the body has been attached to the sub frame and all final items have been installed the entire body assembly shall be undercoated

One (1)

Y__N__

INTERIOR COMPARTMENT PAINT

The interior vertical compartment walls are to be painted white with a black colored spatter finish material.

One (1)

Y__N__

TWO TONE CAB PAINT

The chassis cab exterior shall be two-tone finish painted. The area to be painted shall be sanded and thoroughly prepared then refinished with PPG Concept paint.

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One (1) The upper color to be determined prior to construction.
The lower color to be red to match Dupont K8846 red. Y__N__

TOUCH-UP PAINT

One (1) There shall be touch-up paint furnished with the truck. Y__N__

LETTERING

One (1) Lettering shall be done in gold leaf mylar letters, shaded in black, and encapsulated in clear mylar. Lettering to be placed on each cab door as directed by fire department. Maximum of fifty (50) letters. Y__N__

LETTERING SHALL BE AS FOLLOWS

Arched: WATSONVILLE 3"

Straight: FIRE DEPT. 3"

One (1) Above Grill WATSONVILLE 2-1/2" Y__N__

GOLD LEAF STRIPING

One (1) Striping to be gold leaf mylar with black shading placed on both sides of the apparatus body. Striping to be applied to outer perimeter of body and have four (4) scrolls on each side. Y__N__

REFLECTIVE SAFETY STRIPE

A 6" wide 3M brand Scotchlite #680-10 reflective stripe shall be affixed to the perimeter of the vehicle. Striping shall be placed up to 60" above ground level and shall conform to NFPA reflectivity requirements. At least 60% of the perimeter length of each side and width of the rear, and at least 40% of the perimeter width of the front of the vehicle shall have reflective stripe.

The side stripe shall be applied straight across the apparatus body.

The stripe shall be white in color.

One (1) The color of the striping shall be determined prior to construction. Y__N__

IDENTIFICATION & SAFETY LABELS

A permanent plate shall be installed in the driver's compartment to specify the quantity and type of the following fluids in the vehicle:

1. Engine oil.
2. Engine coolant.
3. Transmission fluid.
4. Pump Transmission Lubrication Fluid.
5. Pump Primer Fluid (If applicable).
6. Drive Axle Lubrication Fluid.

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7. Air-conditioning refrigerant.
8. Air-conditioning lubrication oil.
9. Power steering fluid.
10. Transfer case fluid.
11. Equipment rack fluid.
12. Air compressor system lubricant.
13. Generator system lubricant.

When trucks have been UL certified, a permanent plate with pump performance data and serial numbers shall be installed on the pump panel.

A permanent plate shall be installed in the driver's compartment specifying the maximum number of personnel the vehicle is designed to carry per NFPA standards. It shall be located in an area visible to the driver.

An accident prevention sign stating "DANGER PERSONNEL MUST BE SEATED AND SEAT BELTS MUST BE FASTENED WHILE VEHICLE IS IN MOTION OR DEATH OR SERIOUS INJURY MAY RESULT". The warning sign shall be placed so it is visible from all seating positions.

An accident prevention sign stating "DANGER DO NOT RIDE ON REAR STEP WHILE VEHICLE IS IN MOTION, DEATH OR SERIOUS INJURY MAY RESULT". The warning sign shall be placed so it is visible from the rear step of the vehicle.

If an inlet located at the pump operator's position is valved, it shall be provided with a permanent label that states "WARNING SERIOUS INJURY Or DEATH COULD OCCUR IF INLET IS SUPPLIED BY A PRESSURIZED SOURCE WHEN THE VALVE IS CLOSED".

One (1)

Y__N__

OPERATION / SERVICE MANUALS

The manufacturer shall provide with the vehicle upon delivery, one (1) complete delivery manual. These manuals shall be in a notebook type binder, with reference tabs for each section of the vehicle. Within each section shall be:

1. Individual component manufacturer instruction and parts manuals.
2. Warranty forms for body.
3. Warranty forms for all major components.
4. Warranty instructions and format to be used in compliance to warranty obligations.
5. Wiring diagrams.
6. Installation instructions and drawings for major parts.
7. Visual graphics, electronic photos of installations of major parts.
8. Necessary normal routine service forms, publications and components of body portion of the apparatus.
9. Technical publications on training and instructions for major body components.
10. Warning and safety related notices for personnel protection.
11. Cab and chassis manuals on parts, service and maintenance shall be provided.
12. UL Pump Certification sheets, including the Manufacturer's Record of Apparatus construction details.

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13. Certificate of Compliance to Electrical Warning System Low Voltage test.
14. Line Voltage Electrical System test certificate.
15. Water tank capacity certificate.

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One (1)	ADDITIONAL EQUIPMENT	Y__N__
	The following equipment shall be furnished by the apparatus body builder.	
	LADDERS	
One (1)	A 24-foot, 2-section aluminum fire department extension ladder, ALCO-LITE Model PEL-24, shall be furnished.	Y__N__
One (1)	A 14-foot aluminum roof ladder with folding hooks, ALCO-LITE model PRL-14, shall be furnished.	Y__N__
One (1)	A 10-foot folding aluminum attic ladder, with mounting brackets, ALCO-LITE model FL-10, shall be furnished.	Y__N__
	PIKE POLES	
One (1)	6-foot pike pole with fiberglass handle and steel hook shall be furnished.	Y__N__
One (1)	10-foot pike pole with fiberglass handle and steel hook shall be furnished.	Y__N__
	WHEEL CHOCKS	
One (1)	A pair of heavy-duty aluminum wheel chocks shall be provided and mounted in underbody slide-out mounting brackets as directed by the fire department.	Y__N__
One (1)	MISCELLANEOUS HARDWARE	Y__N__
	There shall be a bag of miscellaneous hardware included with the apparatus. This bag shall contain nuts and bolts that are commonly used on the apparatus.	

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One (1)

Y__N__

WARRANTY

We warrant each new motorized fire apparatus manufactured by CENTRAL STATES FIRE APPARATUS for a period of ONE YEAR from the date of delivery, except for chassis and other components noted herein.

Under this warranty we agree to furnish any parts to replace those that have failed due to defective material or workmanship where there is no indication of abuse, neglect, unusual or other than normal service providing that such parts are, at the option of CENTRAL STATES FIRE APPARATUS, made available for our inspection at our request, returned to our factory or other location designated by us with transportation prepaid within thirty days after the date of failure or within one year from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to defective material or workmanship.

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

This warranty will not apply to any fire apparatus that has been repaired or altered outside our factory in any way, which in our opinion might affect its stability or reliability.

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

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability in connection with the sales of our apparatus unless made in writing by CENTRAL STATES FIRE APPARATUS.

One (1)

Y__N__

5 YEAR ALUMINUM BODY WARRANTY

Central States Fire Apparatus LLC (CSFA) warrants to the original purchaser only, that the all aluminum body, fabricated by Central States Fire Apparatus, under normal use and with reasonable maintenance, be structurally sound and will remain free from corrosion perforation for a period of FIVE (5) years.

This warranty does not apply to the following items that are covered by a separate warranty: paint finish, hardware, moldings, and other accessories attached to this body. In addition, this warranty does not apply to any part or accessory manufactured by others and attached to this body.

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

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Central States Fire Apparatus will replace without charge, repair or make a fair allowance for any defect in material or workmanship demonstrated to its satisfaction to have existed at the time of delivery or not due to misuse, negligence, or accident. If Central States Fire Apparatus elects to repair this body, the extent of such repair shall be determined solely by Central States Fire Apparatus, and shall be performed solely at the Central States Fire Apparatus factory, or at an approved facility. The expense of any transportation to or from such repair facility shall be borne by the purchaser and is not an item covered under this warranty.

Central States Fire Apparatus will not be liable for damages and under no circumstances will its liability exceed the price for a defective body. The remedies set forth herein are exclusive and in substitution for all other remedies to which the purchaser would otherwise be entitled.

Central States Fire Apparatus will be given a reasonable opportunity to investigate all claims. The purchaser must commence any action arising out of, based upon or relating to agreement or the breach hereof, within twelve months from the date the cause of the action occurred.

One (1)

Y__N__

PAINT WARRANTY

The PPG paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of FIVE (5) years beginning the day the vehicle is delivered to the purchaser.

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

GUARANTEE INCLUSIONS:

FULL APPARATUS BODY MANUFACTURED AND PAINTED BY CENTRAL STATES FIRE APPARATUS:

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

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

One (1)

Y__N__

SUBFRAME WARRANTY

Subject to the provisions, limitations and conditions set forth in this warranty, Central States Fire Apparatus, LLC (hereby referred to as "seller"), hereby warrants to each original purchaser only that each new hot dip galvanized or stainless steel body sub frame (exclusive of paint finish and hardware) is structurally sound and free of all structural defects of both material and workmanship and further warrants that it will

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maintain such structural integrity. This warranty terminates upon transfer of possession or ownership by original purchaser.

This warranty is conditioned upon normal use and reasonable maintenance of such sub frame; prompt written notice of all defects to seller or one of the seller's then authorized dealers in the area; no repair or additions there to except by seller or authorized by it; said defect not resulting from misuse, negligence, accident, remount, overloading beyond applicable weight rating by customer or third parties. If any such conditions are not complied with, this warranty shall become void and unenforceable.

Should repairs become necessary under the terms or the warranty, the extent of that repair shall be determined solely by the seller and shall be performed solely at Central States Fire Apparatus, LLC or a repair facility designated by the seller. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.

Seller reserves the unrestricted right at any time from time to time to make changes in the design of and/or improvements on its products without thereby imposing any obligation on itself to make corresponding changes or improvements in or on its products theretofore manufactured.

EXCLUSIONS AND LIMITATIONS: THIS MANUFACTURER'S WARRANTY IS PROVIDED IN PLACE OF ANY AND ALL OTHER REPRESENTATIONS OR IMPLIED WARRANTIES. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTY ON BEHALF OF CENTRAL STATES FIRE APPARATUS, LLC OR ANY OF ITS DISTRIBUTORS OTHER THAN SET FORTH IN THIS MANUFACTURER'S WARRANTY. YOUR RIGHT TO SERVICE AND REPLACEMENT OF PARTS ON THE TERMS EXPRESSLY SET FORTH HERIN ARE YOUR EXCLUSIVE REMEDIES AND NEITHER THE MANUFACTURER NOR ANY OF ITS DISTRIBUTORS SHALL BE LIABLE FOR DAMAGES, WHETHER ORDINARY, INCIDENTAL OR CONSEQUENTIAL.