

Specification

MODEL

The chassis shall be a Gladiator model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2025 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. The chassis manufacturer is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from the chassis manufacturer or their OEM needed to be in compliance with those regulations.

CAB AND CHASSIS LABELING LANGUAGE

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English. All applicable caution, warning, and safety notice labels shall be Innovative Controls brand. Where applicable to the location within the specific layout and label package of the cab and chassis, the labels shall include decorative chrome bezels. Designs shall include bezels that fit individual labels or packaged configurations of labels in certain common locations.

APPARATUS TYPE

The apparatus shall be a Quint vehicle designed for emergency service use. The apparatus shall include a permanently mounted fire pump which has a minimum rated capacity of 750 gallons per minute (3000 L/min), a water tank, a hose storage area, a mid mount aerial ladder or elevating platform with a permanently mounted waterway, and compliment of ground ladders.

VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

VEHICLE ANGLE OF APPROACH PACKAGE

The angle of approach of the apparatus shall be a minimum of 8.00 degrees.

NFPA1901 Angle of Approach definition:

“To determine the angle of approach, place a thin steel strip against the front of the tires where they touch the ground or stretch a tight string from one front tire to the other at the front where they touch the ground. Determine the lowest point (component or equipment) on the vehicle forward of the front tire that would make the smallest angle of approach. Hang a plumb bob from the lowest point and mark the point on the ground where the point of the plumb bob touches. Measure the vertical distance from the ground to the point where the plumb bob was hung (distance V). Measure the horizontal distance from the plumb bob point to the steel strip or string running from front tire to front tire (distance H). Divide the vertical distance by the horizontal distance. The ratio of V/H is the tangent of the angle of approach. If the ratio is known, the angle of approach can be determined from a table of trigonometric functions of angles or from a math calculator. The standard requires a minimum angle of approach of 8.00 degrees: since the tangent of 8.00 degrees is 0.1405, if V divided by H is 0.1405 or larger, the angle of approach is 8.00 degrees or greater.”

AXLE CONFIGURATION

The chassis shall feature a 6 x 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be 24,000 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 62,000 pounds.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

PUMP PROVISION

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the vehicle is shifted into pump mode while the transmission is in neutral and the transmission output speed translates to less than 1 mph. When the conditions are met the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally.

WATER & FOAM TANK CAPACITY

The chassis shall include a carrying capacity of up to 750 gallons (2839 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.

CAB STYLE

The cab shall be a custom, fully enclosed, MFD model with a flat roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the "A" pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and roof skin shall be 0.13 inch thick; the rear wall skin shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 99.40 inches wide with a minimum interior width of 91.00 inches. The overall cab length shall be 131.10 inches with 54.00 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner in the non-raised roof area and a rear floor to headliner height of 55.00 inches at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 49.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up

to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 51.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the "Classic" design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

FRONT GRILLE

The front cab fascia shall include a classic box style, 304 stainless steel front grille. The grille shall measure 55.45 wide X 33.50 inches high X 1.50 inches deep. The upper portion of the grille shall be hinged to provide service access behind the grille. The grille shall include a minimum free air intake of 750.00 square inches.

CAB UNDERCOAT

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

CAB SIDE DRIP RAIL

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

CAB PAINT EXTERIOR

The cab exterior shall be painted two tone per customers specified paint colors following the RFG-SR-001 paint standards.

CAB PAINT PROCESS/MANUFACTURER

The cab shall be painted with Sikkens paint prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the cab shall be mechanically etched by sanding disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once all imperfections on the exterior surfaces are removed and sanded smooth, body fillers shall be applied to the cab on all surfaces that require a critically aesthetic finish and sanded smooth.

The entire cab shall then be coated with a high quality base primer that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be sanding the cab to a smooth finish followed by sealing the seams with an automotive seam sealer. The minimum thickness of the primer coat after sanding shall be 2.50 mils with a maximum thickness of 5.00 mils.

The cab shall then be painted the specific color(s) designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on an emergency scene. The paint shall have a minimum thickness of 1.00 mils with a maximum of 4 mils, followed by a clear top coat with a minimum of 2.5 mils and a maximum of 3.5 mils. The entire cab shall then be baked to speed the curing process of the coatings.

CAB PAINT PRIMARY/LOWER COLOR

The lower paint color shall be Sikkens FLNA 32538 Red.

CAB PAINT SECONDARY/UPPER COLOR

The secondary/upper paint color shall be Sikkens FLNA 41876 White.

CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet at a breakline on the cab which shall be located approximately 1.00 inch below the door windows on each side of the cab. The breakline shall curve down at the front cab corners to approximately 5.00 inches below the windshields on the front of the cab.

CAB PAINT PINSTRIPE

Where the upper and lower paint colors meet a temporary 0.50 inch wide black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM.

CAB PAINT WARRANTY

Purchaser shall receive a Paint and Finish (Exterior Clear coated) Ten (10) Years limited warranty in accordance with, and subject to, warranty certificate RFW0710. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with a multi-tone silver gray texture finish.

CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.

CAB ENTRY DOOR TYPE

All cab entry doors shall be full length in design to fully enclose the lower cab steps. Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.

CAB INSULATION

The cab ceiling and walls shall include a nonwoven polyester fiber insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

CAB STRUCTURAL WARRANTY

Purchaser shall receive a Cab Structure (Aluminum) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0602. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

OEM WIRING

The wiring system shall include a prewire for ECM park brake input and engine ground return circuits located behind the switch panel. The circuits shall include an extra 2.00 feet of wire and shall be labeled "ECM Park Brake Input".

VEHICLE DISPLAY

The multiplex electrical system shall include (2) Weldon Vista IV displays which shall be located one (1) on the right side of the dash in the switch panel and one (1) on the left side of the dash in the switch panel. The Vista IV displays shall feature full color LCD display screens which include a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screens shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista IV displays shall offer varying fonts and background colors. The displays shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

LOAD MANAGEMENT SYSTEM

The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position

- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system. The laptop connection shall be a panel mounted female type B USB connection point, remotely mounted in the left side foot well.

The chassis shall also include an FRC DVR that individually records all connected cameras and shall save the footage to SD cards for future review. The DVR system shall have four (4) SD card slots (256 GB each) for 1TB maximum storage. It shall have GPS tracking built into the system.

ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 225 amp master switched and fused power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections.

AUXILIARY ACCESSORY POWER

An auxiliary six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed behind the driver's seat. The fuse panel shall be protected by a 40 amp fuse. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

ELECTRICAL SYSTEM WARRANTY

Purchaser shall receive an Electrical System Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0202. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

ENGINE

The chassis engine shall be a Cummins X15 engine. The X15 engine shall be an in-line six (6) cylinder, four-cycle diesel-powered engine. The engine shall offer a rating of 605 horsepower at 1800 RPM and shall be governed at 2100 RPM. The torque rating shall feature 1850-foot pounds of torque at 1000 RPM with 912 cubic inches (14.9 liter) of displacement.

The X15 engine shall feature a VGT™ Turbocharger, a high-pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2021-26 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. High quality lubricating oil that meets Cummins Engineering Standard CES 20086/CES20087 shall be used, see engine manual and vehicle data tag.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

If a pre-2027 emission engine is NOT available at the time of build (starting production on January 1, 2026) your order will automatically be upgraded and charged for either the 2027 engine compliant Cummins X-10 or X-15, with all associated costs being passed on to the end user. No exceptions.

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade 0.19 of an inch thick aluminum alloy plate. The tunnel shall be a maximum of 46.50 inches wide X 29.00 inches high.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control which shall be pre-set to operate the engine at a specified RPM to increase alternator output if the system voltage drops to 12.5 volts. This device shall automatically operate only when the engine is running, the transmission is in neutral, and with the parking brake set. The automatic high idle will stay engaged for a minimum of ten (10) minutes and until the system, voltage has reached 13.0 volts. Application of the service brake will override the automatic high idle and reset timer. The vehicle shall be equipped with a high-idle speed virtual button on the vehicle display and control screen to activate/deactivate manual control only. It shall be pre-set so when activated, it will operate the engine at the specified RPM to increase alternator output. This device shall operate only when the engine is running, the transmission is in neutral, and with the parking brake set. When automatically engaged the high idle shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake pedal is released, or when the transmission is placed in neutral. Virtual control screen shall not override automatic high idle between voltage parameters during timed cycle. Display shall indicate when high idle is disabled, enabled, or active.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

The engine shall include programming which will govern the top speed of the vehicle.

AUXILIARY ENGINE BRAKE

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle's brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

AUXILIARY ENGINE BRAKE CONTROL

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The compression brake shall be controlled via an off/low/high virtual button through the vehicle display and control screen. The system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

FLUID FILLS

The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

ENGINE DRAIN PLUG

The engine shall include an original equipment manufacturer installed oil drain plug.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a pump control switch, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch and high idle indicator light. The harness shall contain interlocks that will prevent shifting to road or pump mode unless the transmission output speed translates to less than 1 mph and the transmission is in neutral. The shift to pump mode shall also require the park brake be set.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator. This ember separator shall be designed to protect the downstream air filter from embers using a combination of unique flat and crimped metal screens packaged in a heavy duty galvanized steel frame. This multilayered screen shall trap embers and allow them to burn out before passing through the pack.

The engine air intake system shall also include an air cleaner mounted above the radiator. This air cleaner shall utilize a replaceable dry type filter element designed to prevent dust and debris from being ingested into the engine. A service cover shall be provided on the housing, reducing the chance of contaminating the air intake system during air filter service.

The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton fully variable type fan drive with SmartClutch J-1939 CAN controller. The clutch fan shall override the thermostatic variable speed and function as full on automatically in pump mode.

The variable speed fan clutch only engages at the amount needed for proper cooling to facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail-safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure. The fan speed shall include a J-1939 CAN clutch controller to receive signal from the engine control module to activate at variable rates of speed. Variable speeds shall be set through thermostatic and engine speed signals to run as efficiently and quietly as required to maintain temperature.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injected molded polymer fan with a three (3) piece fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and rearward oriented sight glass to observe coolant in the system. A cold fill and observation line shall be included within the frame mounted translucent recovery bottle to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.

The radiator and charge air cooler shall be removable through the bottom of the chassis.

ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame components.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The

coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ENGINE COOLANT FILTER

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

COOLANT HOSES

The cooling system hoses shall be blue stripe heater hose with formed silicone radiator coolant hoses and formed aluminized steel tubing. The heater hose, radiator hose, and tubing shall be secured with stainless steel constant torque band clamps.

ENGINE COOLANT OVERFLOW BOTTLE

A remote engine coolant overflow expansion bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overflow rather than allow the fluid to drain on the ground.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

ENGINE EXHAUST SYSTEM

The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, and downpipe from the charge air cooled turbo. The single module shall include four temperature sensors, diesel particulate filter (DPF), urea dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be mixed and injected into the system through the DPF and SCR.

The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The single module after treatment through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system after treatment module shall be mounted below the frame in the inboard position. The mounting brackets shall be mounted on the inside of the frame.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

The exhaust flex joint shall not include the thermal exhaust wrap.

EMISSIONS SYSTEMS WARRANTY

Purchaser shall receive a Regulated Emissions Systems Five (5) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0140. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Allison formulated Castrol TranSynd™ synthetic transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st 3.51:1
 2nd 1.91:1
 3rd 1.43:1
 4th 1.00:1
 5th 0.74:1
 6th 0.64:1 (if applicable)
 Rev 4.80:1

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will select five (5) speeds of operation. The sixth speed over drive shall be available with the activation of the mode button on the shifting pad. The transmission programming shall only include S1 performance shift schedules. The mode button shall not include a secondary economy shift schedule.

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V/VI-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V/VI-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

<u>Function ID</u>	<u>Description</u>	<u>Wire assignment</u>
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

LH PTO

A PTO shall be installed on the transmission by the OEM.

LH PTO MODEL

A ten (10) bolt Chelsea model 280-GGFJP-B5XD heavy duty transmission driven PTO shall be installed. The clutched shifted PTO is designed specifically for the Allison world transmission and provides an intermittent and continuous torque rating of 360 lb. ft.

PTO LOCATION

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.

LH PTO CONTROL

Switches for the power take off shall be wired to the V-mux node to be used by the OEM. There shall be an on/off rocker switch labeled “Aerial Master” wired to a V-mux input and output with integral light wired to the v-mux input terminal of the switch that shall illuminate when the switch in on and the v-mux output is active.

There shall be an on/off rocker switch labeled “Aerial PTO” activated by the “Aerial Master” rocker switch with an input to the V-mux node when the switch is on and an integral light activated by an independent V-mux output. The switches shall be located on dash.

PTO PROGRAMMING

The power take off shall be programmed for operator control such that it shall only engage at or below 900 engine RPM and a transmission output speed of 250 RPM. The PTO shall operate in a range up to 4000 engine RPM or a transmission output speed of 5000 RPM. The PTO programming shall provide for automatic disengagement set at a specified engine speed of 4000 RPM, or transmission output speed of 5000 RPM. The range shall be programmed to protect equipment driven from the power take off.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with MSI 1810 series universal joints for the main drivelines, and 1710 series for the inter-axle shaft. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat[®]. The drivelines shall include Meritor brand u-joints with thrust washers.

MIDSHIP PUMP / GEARBOX

A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.

MIDSHIP PUMP / GEARBOX MODEL

The midship pump/gearbox provisions shall be for a Waterous CSUC20 or C22 pump rearward.

MIDSHIP PUMP GEARBOX DROP

The Waterous pump gearbox shall have a “D” (long) drop length.

MIDSHIP PUMP RATIO

The ratio for the midship pump shall be 2.46:1.

MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE

The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 81.50 inches.

PUMP SHIFT CONTROLS

One (1) air pump shift control panel shall be located on the left hand side of the engine tunnel, integrated with the shifter pod. The following shall be provided on the panel: a three (3) position control lever; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline and shall include pump instructions. An instruction plate describing the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver's position per NFPA **16.10.1.3**. The road mode shall be selected when the control lever is in the forward position and pump mode shall be selected when the control lever is in the rearward position.

The control lever center position shall exhaust air from both pump and road sides of the pump gear box shift cylinder.

PUMP SHIFT CONTROL PLUMBING

Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25 inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Racor GreenMAX 6600R fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve and a see-through cover to allow visual inspection of fuel and filter condition. The Racor 6600R shall meet engine requirements for particulate size, collection capacity, removal efficiency, and water removal efficiency. The filter shall be capable of handling a maximum flow rate of 150 gallons per hour.

A secondary fuel filter shall be included as approved by the engine manufacturer.

An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL COOLER

A fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall include an electrical fan and temperature-controlled relay switch.

FUEL TANK

The fuel tank shall have a capacity of sixty-eight (68) gallons and shall measure 35.00 inches in width X 17.00 inches in height X 29.00 inches in length.

The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 12 gauge aluminized steel. The exterior of the tank shall be powder coated black and then painted to match the frame components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-cured pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum.

Any proposals offering painted fuel tanks with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of ASTM A-36 hot-dip galvanized steel. The fuel tank straps shall include a natural galvanized finish.

FUEL TANK MISCELLANEOUS OPTIONS

The fuel tank shall be temporarily mounted, to be permanently relocated by the OEM. The tank and mounting straps as specified shall be included with the chassis along with components for permanent standard installation.

FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.

FUEL TANK SERVICEABILITY PROVISIONS

The chassis fuel lines and sender wiring shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 12.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FUEL TANK DRAIN PLUG

A 0.5 inch NPT magnetic drain plug shall be centered in the bottom of the fuel tank.

FRONT AXLE

The front axle shall be a Hendrickson STEERTEK Non-drive front axle, NXT Fire/Rescue model. The axle shall include a 3.74 inch drop and a 70.87 inch king pin intersection (KPI). The axle shall be a box-shaped fabricated beam with integrated suspension. The axle shall include a conventional style hub with a standard knuckle. The weight capacity for the axle shall be rated to 24,000 pounds.

FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

FRONT SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the front axle suspension.

FRONT SUSPENSION

The front suspension shall include a parabolic leaf spring pack integrated into the Hendrickson STEERTEK NXT axle consisting of 58.40 inches long and 4.00 inches wide tapered leaf springs and shall feature a military double wrapped front eye. Spring eyes shall have Hendrickson's proprietary threaded pin bushings to increase roll stiffness. The spring capacity shall be rated specifically to the axle configuration from 18,000 and up to 24,000 pounds.

STEERING COLUMN/ WHEEL

The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 45-degrees to the left and 43-degrees to the right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85 with an assist cylinder.

CHASSIS ALIGNMENT

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

REAR AXLE

The rear axle shall be a Meritor model RT-58-185 tandem drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 63,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.56 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for five (5) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL CONTROL

The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. The inter-axle differential lock shall be controlled by a virtual button on the vehicle display and control screen. The vehicle display shall indicate when positive engagement of the inter-axle differential lock has occurred.

A driver controlled differential lock shall be installed on one of the tandem rear axles. This feature shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH. The differential lock shall be controlled by a virtual button on the vehicle display and control screen. The vehicle display shall also indicate when positive engagement of the differential control has occurred.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 65 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The tandem axle shall feature a Raydan Air-Link AL-600 air suspension. The Air-Link AL-600 shall feature a unique air ride and walking beam suspension design which combines a super smooth ride with durability. The suspension has only two (2) moving parts for long wear and low maintenance cost. The rear tandem suspension shall have 56.00 inch axle centers.

Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load.

The rear suspension shall be run flat capable at reduced speeds.

The rear suspension capacity shall be rated at 54,000 to 62,000 pounds.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

TIRE INTERMITTENT SERVICE RATING

The chassis shall be rated using Intermittent Service ratings provided to the emergency vehicle market by the tire manufacturers as the basis for determining the maximum vehicle load and speed.

FRONT TIRE

The front tires shall be Michelin 425/65R-22.5 20PR "L" tubeless radial XZY3 mixed service tread.

The front tire stamped load capacity shall be 22,800 pounds per axle with a nominal speed rating of 65 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 24,396 pounds per axle with a maximum speed of 65 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall be 22,800 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR TIRE

The rear tires shall be Michelin 315/80R-22.5 20PR "L" tubeless radial XDN2 Grip all weather tread.

The rear tire stamped load capacity shall be 33,080 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 35,396 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR AXLE RATIO

The rear axle ratio shall be 5.38:1.

TIRE PRESSURE INDICATOR

There shall be electronic chrome LED valve caps shipped loose for installation by the OEM which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch aluminum wheels. The outer face of the wheels shall feature Alcoa's Dura-Bright® finish as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 9.00 inch aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment as an integral part of the wheel surface. The inner rear wheels shall be Alcoa hub piloted, 22.50 inch X 9.00 inch aluminum wheels with a polished inner and outer surface and Alcoa Dura-Bright® wheel treatment as an integral part of the wheel surface. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

BALANCE WHEELS AND TIRES

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include, at a minimum, a three (3) air tank, four (4) reservoir system with a total of 6236 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

The tandem rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A six (6) sensor, six (6) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the tandem rear axle. The ATC system shall apply the ABS when the drive wheels lose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A virtual button on the vehicle display and control screen shall be provided and properly labeled "mud/snow". When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle's lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 8.63 inch S-cam drum type. The brakes shall feature a cast iron shoe.

PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

SUPPLEMENTAL BRAKE

A supplemental brake engagement shall be supplied that can only be engaged while the rear spring brakes are engaged. In addition to the mechanical rear brake engagement, the front service brakes shall

also be engaged via air pressure, providing additional braking capability. Front service brake activation shall be accomplished with activation of the rear mechanical park brake valve.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.

The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver.

REAR BRAKE SLACK ADJUSTERS

Haldex rear brake automatic slack adjusters shall be installed on the axle.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be mounted behind the battery box on the left hand side.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with type 24 brake chambers as supplied with the Hendrickson STEERTEK NXT axle.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco[®] SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket.

AUXILIARY AIR RESERVOIR

One (1) auxiliary air reservoir with a 2084 cubic inch capacity shall be installed on the chassis to act as an additional reserve supply to the air system for air horn, air tool, or other non-service brake use. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

MOISTURE EJECTORS

Manual pet-cock type drain valves shall be installed on all reservoirs of the air supply system.

AIR SUPPLY LINES

The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Push to connect type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

AIR INLET CONNECTION

An air connection for the shoreline air inlet shall be supplied.

AIR INLET LOCATION

The air inlet shall be installed in the left hand side lower front step in the forward position.

AIR INLET/ OUTLET FITTING TYPE

The air connector supplied shall be a 0.25 inch size Tru-Flate Interchange style manual connection which is compatible with Milton 'T' style, Myers 0.25 inch Automotive style and Parker 0.25 inch 10 Series connectors.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

WHEELBASE

The chassis wheelbase shall be 244.00 inches.

REAR OVERHANG

The chassis rear overhang shall be 68.50 inches.

FRAME

The frame shall consist of triple side rails and cross members forming a ladder style frame. The side rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep X 0.38 inches thick, with an inner channel 9.44 inches high X 3.13 inches deep X 0.38 inches thick, and a second inner channel, 8.55 inches high X 2.75 inches deep X 0.25 inches thick which shall be provided extending from the rear of the cab to the forward rear suspension cross member. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. The triple rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,921,500 inch pounds and have a minimum section modulus of 35.65 cubic inches. The frame shall measure 35.00 inches in width.

Proposals calculating the frame strength using the "box method" shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

MISCELLANEOUS FRAME OPTIONS

The frame shall include drillings which shall be specific to mounting a Smeal 105RM, 100RM, 125RM, or 100MM substructure.

See PDF for OEM Specified pattern.

FRAME CLEAR AREA

The chassis frame shall be left clear of chassis mounted components inside and outside the frame rails within the first 52.50 inches behind the cab to allow space for OEM installed components. Cross members may be installed in the clear area if required for proper frame or driveline configuration.

FRAME PAINT

The frame shall be hot dip galvanized prior to assembly and attachment of any components. The components that shall be galvanized shall include:

- Main frame "C" channel or channels
- Front splayed rails and fish plates
- Cross members (excluding suspension cross members)

- Cross member gussets
- Fuel tank mounting brackets
- Fuel tank straps (unless material/finish is specified in 3130 subcat)
- Air tank mounting brackets (unless material/finish is specified in 3205, 3305, or 2232 subcat)
- Exhaust mounting brackets
- Air dryer bracket
- Air cleaner skid plate (if applicable)
- Radiator skid plate (if applicable)
- Battery supports
- Battery trays (unless material/finish is specified in 5106 subcat)
- Battery covers (unless material/finish is specified in 5107 subcat)

The frame parts which are not galvanized shall be powder coated prior to any attachment of components. Parts which shall be powder coated shall include but are not limited to:

- Bumper extensions
- Steering gear bracket
- Air tanks (unless color coded tanks are specified in 3205 subcat)

Other non-galvanized under carriage components which are received from the suppliers with coatings already applied shall include but are not limited to:

- Suspension components
- Front and rear axles

All powder coatings, primers and paint used on the non-galvanized components shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-cured pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

FRAME PAINT - MISCELLANEOUS

There shall be an RTV type sealant applied to the seams between the frame rail and the frame liner(s) to help prevent water intrusion between the frame rails. The sealant shall be applied to all seams along the length of the frame and at the top, front, and rear ends of the liner(s). The sealant shall be applied after the frame rails have been assembled and painted.

FRAME ASSEMBLY STRUCTURAL

Purchaser shall receive a Frame Assembly Structural Fifty (50) Years or 250,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0305. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRAME RAIL CORROSION

Purchaser shall receive a Frame Rail Corrosion (Zinc Plate and Powder Coat) Twenty Five (25) Years or 150,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0316. The

warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRAME COMPONENTS CORROSION

Purchaser shall receive a Frame Components Corrosion (Zinc Plate) Twenty (20) Years or 132,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0314. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05 inch flange and shall be 104.50 inches wide with angled front corners.

The bumper shall be primed and painted as specified.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 6.00 inches ahead of the cab.

FRONT BUMPER PAINT

The front bumper shall be painted the same as the lower cab color.

FRONT BUMPER APRON

The 6.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include mounting hardware designed to recess or flush mount.

MECHANICAL SIREN LOCATION

The siren shall be recess mounted on the left side of the front fascia of the bumper, in the outboard position. The siren shall be mounted completely behind the face of the bumper to protect the siren from damage.

AIR HORN

The front bumper shall include two (2) Hadley brand E-Tone air horns which shall measure 21.00 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish on the exterior and a painted finish deep inside the trumpet.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

AIR HORN RESERVOIR

One (1) air reservoir, with a 2084 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

There shall be one (1) Federal Signal Inc. Dynamax® model ES100C, 100 watt speaker provided. The speaker shall measure 5.90 inches tall X 5.50 inches wide X 2.30 inches deep. The speaker shall include a Federal Signal “Electric F” style grille which shall measure 6.61 inches tall X 6.78 inches wide.

ELECTRONIC SIREN SPEAKER LOCATION

The electronic siren speaker shall be located on the front bumper face on the right side outboard of the frame rail in the far outboard position.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty tow hooks, painted to match the frame components, shall be installed behind the front bumper in the forward position, bolted directly to the side of each chassis frame rail with grade 8 bolts.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT CONTROL RECEPTACLE

The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.

CAB WINDSHIELD

The cab windshield shall have a surface area of 2969.88 square inches and be of a two (2) piece wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self locking window rubber.

GLASS FRONT DOOR

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The driver's door shall include a switch for each powered door window in the cab.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

Each front door window shall include patent pending heated glass technology to reduce fogging with activation of the defroster.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR RH

The rear right hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the door panel ledge and on the driver's control panel.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR LH

The rear left hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the door panel ledge and on the driver's control panel.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS SIDE MID RH

The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall

be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID RIGHT HAND

The window located on the right hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS SIDE MID LH

The cab shall include a window on the left side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID LEFT HAND

The window located on the left hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

CLIMATE CONTROL

A ceiling mounted combination defroster and cabin heating and air conditioning system shall be located above the engine tunnel area. The system covers and plenums shall be of severe duty design made of aluminum which shall be coated with a customer specified interior paint. The design of the system's covers shall provide quick access to washable air intake filters as well as easy access to other serviceable items.

The air delivery plenums provide targeted airflow directly to the vehicle occupants. Six (6) adjustable louvers will provide comfort for the front seat occupants and ten (10) adjustable louvers will provide comfort for the rear crew occupants.

The system shall be capable of producing up to 12 FPM of air velocity at all occupant seating positions. Separate front and rear blower motors shall be of brushless design and shall be controlled independently. It shall be capable of reducing the interior cabin air temperature from 122° F (+/- 3° F) to 80° F in thirty minutes with 50% relative humidity and full solar load as described in SAE J2646.

The system shall also provide heater pull up performance which meets or exceeds the performance requirements of SAE J1612 as well as defrost performance that meets or exceeds the performance requirements of SAE J381.

A gravity drain system shall be provided that is capable of evacuating condensate from the vehicle while on a slope of up to a 13% grade in any direction.

The air conditioning system plumbing shall be a mixture of custom bent zinc coated steel fittings and Aeroquip flexible hose with Aeroquip EZ-Clip fittings.

The overhead heater/defroster plumbing shall include an electronic flow control valve that re-directs hot coolant away from the evaporator, via a bypass loop, as the temperature control is moved toward the cold position.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab. There shall be one (1) additional seasonal shut-off valve located adjacent to the first valve for a total of two (2) shutoff valves, one (1) in each heater/defroster coolant hose. The cab must be tilted to access the shut-off valves. Any component which needs to be accessed to perform system troubleshooting shall be accessible by one person using basic hand tools. Regularly serviced items shall be replaceable by one person using basic hand tools.

*****The chassis manufacturer recommends that the overall climate system performance be based off third-party testing in accordance with the Society of Automotive Engineering standards as a complete system.***

Individual component level BTU ratings is not an accurate indicator of the performance capability of the completed system. System individual component BTU ratings:

- Air conditioning evaporator total BTU/HR: 82,000
- Air conditioning condenser total BTU/HR: 59,000
- Heater coil total BTU/HR: 98,000

Performance data specified is based on testing performed by an independent third-party test facility using a medium four-door 10" raised roof cab equipped with an ISL engine.

CLIMATE CONTROL DRAIN

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

CLIMATE CONTROL ACTIVATION

The heating, defrosting and air conditioning controls shall be located on the vehicle display and control screen.

HVAC OVERHEAD COVER PAINT

The overhead HVAC cover shall be painted with a multi-tone silver gray texture finish.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed on the center of the cab, mid-roof.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted compressor. The compressor shall be compatible with R134-a refrigerant.

*****The chassis manufacturer recommends that the overall climate system performance be based off third-party testing in accordance with the Society of Automotive Engineering standards as a complete system.***

Individual component level ratings are not an accurate indicator of the performance capability of the completed system.

Refrigerant Compressor displacement: 19.1 cubic inches per revolution.

CAB CIRCULATION FANS FRONT

The cab shall include two (2) all metal 6.00 inch air circulation fans installed in the outer front cab corners. Each fan shall be controlled by an individual toggle switch on each fan. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.

UNDER CAB INSULATION

The underside of the cab tunnel surrounding the engine shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.30 inch thick including a multi-layer foil faced glass cloth and polyester fiber layer. The foil surface acts as protection against heat, moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by acrylic pressure sensitive adhesive.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

REAR WALL INTERIOR TRIM

The rear wall of the cab shall be trimmed with vinyl.

HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum.

TRIM CENTER DASH

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.

TRIM LH DASH

The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.38 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

POWER POINT DASH MOUNT

The cab shall include two (2) 12 volt cigarette lighter type receptacles in the cab dash to provide a power source for 12 volt electrical equipment. The receptacles shall be wired battery direct.

The cab shall also include two (2) Dual universal serial bus (USB) charging receptacles in the cab dash rocker switch cutout to provide a power source for USB chargeable electrical equipment. Each USB receptacle shall include one (1) USB port capable of a 5 Volt-2.4 amp output and one (1) USB port capable of a 5 Volt-2.4 amp output. The receptacles shall be wired battery direct and include a backlit legend.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of SAE 304 stainless steel with embossed perforations and diamond shaped cutout. The perforations and cutouts shall allow water and other debris to flow through rather than becoming trapped

within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have drainage holes beneath the back of the step to allow debris and water to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 8 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed with a Flex-Tred[®] adhesive grit surface material.

UNDER CAB ACCESS DOOR

The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior paint with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their department, city, township, or county.

CAB DOOR TRIM REFLECTIVE

The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the rear outer edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes and a Spartan logo. The chevron tape shall measure 6.00 inches in height.

INTERIOR GRAB HANDLE "A" PILLAR

There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each "A" post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

INTERIOR SOFT TRIM COLOR

The cab interior soft trim surfaces shall be gray in color.

INTERIOR TRIM SUNVISOR

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be gray in color.

CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted with multi-tone silver gray texture finish.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with multi-tone silver gray texture finish.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with multi-tone silver gray texture finish. Any accessory pods attached to the dash shall also be painted this color.

TRIM LH DASH INTERIOR PAINT

The left hand dash shall be painted with a multi-tone silver gray texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be painted with multi-tone silver gray texture finish.

DASH PANEL GROUP

The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

The center dash panel shall include six (6) switch positions in the upper left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SWITCHES LEFT PANEL

The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel. The switch shall have backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall include one (1) rocker switch position in the lower right hand portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the vehicle display and control screen(s).

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and applicable audible alarm shall remain active until all occupied seats have the seat belts fastened.

SEAT MATERIAL

The Bostrom Firefighter seats shall include a covering of extra high strength, wear resistant fabric made of durable low seam Durawear Plus™ ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus™ meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.

If applicable, Theatre style seats located in the cab shall be high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts.

SEAT BACK LOGO

The seat backs shall include the logo for New England Fire Equipment and Apparatus Corp. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom 500 Series Firefighter Sierra model seat with air suspension. The four-way seat shall feature a 1.50 inches vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

SEAT MOUNTING DRIVER

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

SEAT OFFICER

The officer's seat shall be a H.O. Bostrom 500 Series Sierra seat model. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK OFFICER

The officer's seat shall feature a SecureAll™ SCBA locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING OFFICER

The officer's seat shall be installed in an ergonomic position in relation to the cab dash.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

SEAT REAR FACING OUTER LOCATION

The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the left side front seat and one (1) located directly behind the right side front seat.

The primary position designation per NFPA 1900 2024 edition, shall only declare the positioning in the cab offers a minimum width of 27.60 inches of shoulder clearance without overlap of any other primary

seating position and a minimum of 10.80 inches each side of seat center line. Clear width may be offset from center of seat cushion by up to 3.00 inches. It shall also offer a minimum of 22.00 inches of shoulder width clearance without any overlap of any position.

SEAT CREW REAR FACING OUTER

The crew area shall include a seat in the rear facing outboard position which shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be spring load hinged and compact in design for additional room. The seat shall include a "Fold and Hold" feature so that the cushion shall remain in the seated position and simply touched to flip up.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK REAR FACING OUTER

The rear facing outboard seat shall feature a Bostrom SecureAll™ self contained breathing apparatus (SCBA) locking system which shall store most U.S. and International SCBA brands and bottle sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

The bracket system shall be free of straps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the center of the bottom seat cushion for easy access and to eliminate hooking the release handle with clothing or other equipment.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING REAR FACING OUTER

The rear facing outer seats shall offer special mounting positions which shall be 2.00 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats.

SEAT FORWARD FACING CENTER LOCATION

The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall.

SEAT CREW FORWARD FACING CENTER

The forward facing center seat shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position. The seat and cushion shall be hinged and compact in design for additional room. The seat shall include a “Fold and Hold” feature so that the cushion shall remain in the seated position and simply touched to flip up.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING CENTER

The forward facing center seat shall feature a SecureAll™ self contained breathing apparatus (SCBA) locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for

all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include an enclosed seat frame located and installed on the rear wall. The seat frame shall measure 42.38 inches wide X 12.38 inches high X 22.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The seat box shall be painted with the same color as the remaining interior.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the seat frame storage area, one (1) on each side of the seat frame. Each access point shall be covered by a hinged door which measures 15.00 inches in width X 10.63 inches in height with an opening that measures 13.75 inches wide X 10.00 inches high.

SEAT MOUNTING FORWARD FACING CENTER

The forward facing center seats shall be installed facing the front of the cab.

CAB FRONT UNDERSEAT STORAGE ACCESS DOOR

The right under seat storage area shall have a solid aluminum hinged door with non-locking latch.

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have a multi-tone silver gray texture finish.

WINDSHIELD WIPER SYSTEM

The cab shall include a triple arm linkage wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers; each shall be affixed to a radial arm. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's

position. The windshield wipers shall be interlocked with the park brake allowing activation only when the park brake is released.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow “Check Message Center” indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a “Check Washer Fluid Level” message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of a fiber reinforced plastic composite with a black matt finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

DOOR LOCKS

Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out.

GRAB HANDLES

The cab shall include one (1) 18.00 inch three-piece knurled aluminum anti-slip exterior grab handle behind each cab door. The Hansen Anti-Slip Rails shall be mounted in bright anodized aluminum 4000 Series II stanchions, complete with weep holes to prevent the buildup of moisture.

The grab rails shall include red reflective tape.

LIGHTED GRAB HANDLES

The grab rails shall include a 12 volt, 17.00 inch long clear LED light to provide an increased margin of safety for night time cab entry and egress.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style dual vision mirror heads model 613315 shall be provided and installed each of the front cab doors.

The mirrors shall be mounted via 1.00 inch diameter tubular stainless steel arms to provide a rigid mounting to reduce vibration.

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an integral convex mirror in the mirror head below the flat glass to provide wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions.

The mirror backs shall be constructed of vacuum formed chrome plated ABS plastic housings that are corrosion resistant and shall include an amber marker light. The mirrors shall be manufactured with the finest quality non-glare glass.

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a rocker switch in the mirror control panel on the left side dash.

AUXILIARY EXTERIOR MIRRORS

The cab exterior shall include one (1) Retractable 10.00 inch diameter polished stainless steel convex look down mirror. The mirror shall be located above the right side front windshield using a Retractable model 612665 stainless steel arm assembly to provide a stable three-point mount to reduce mirror vibration. The mirror shall provide additional visibility to the right front corner of the vehicle.

TRIM REAR WALL EXTERIOR

The exterior rear wall of the cab shall include an overlay of 3003-H22 aluminum tread plate which shall be 0.07 inches thick. This overlay shall cover the entire rear wall of the cab.

TRIM ROOF

The entire cab roof shall include 3003-H22 bright aluminum embossed tread plate which is 0.08 inches thick. This plate shall be intended for reinforcement value and shall be the full width of the flat portion of the roof centered left to right.

The tread plate shall be held in place using stainless steel fasteners and shall be sealed with silver silicone caulk around the perimeter of the tread plate and at each mounting screw.

CAB FENDER

Wheel well liners shall be integrated into cab design and include a bed liner undercoat to limit road splash and enable easier cleaning. Each outer fenderette shall be 3.50 inches wide made of SAE 304 polished stainless steel.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them.

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include three (3) Spartan emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on each of the cab sides.

IGNITION

A master battery system with a keyless start ignition system shall be provided. There shall be a three-position rocker switch with off, battery, and ignition positions as well as a stainless-steel etched engine start push-button. The engine start button shall include an illuminated LED halo ring. Both switches shall be mounted to the left of the steering wheel on the dash.

The engine start switch shall only operate when the master battery and ignition switch is in the "ignition" position.

BATTERY

The single start electrical system shall include six (6) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

BATTERY TRAY

The batteries shall be installed within two (2) steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY BOX COVER

Each battery box shall include a steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR

The charging system shall include a 360 amp Niehoff 12 volt alternator. The alternator shall include an ignition excited external regulator.

STARTER MOTOR

The single start electrical system shall include a Delco brand starter motor.

BATTERY CONDITIONER

A Kussmaul Auto Charge Chief 6012 battery conditioner shall be supplied. The battery conditioner shall provide a 60 amp output for the chassis batteries and a 20 amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position and shall include a battery temperature sensor.

BATTERY CONDITIONER DISPLAY

A Kussmaul auto charge status center display shall be supplied. The auto charge display shall be mounted in the cab, viewable through the cab mid side window behind the left front door.

AUXILIARY AIR COMPRESSOR

A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be installed under the dashboard on the right-hand side, forward of the officer's seating position. The air compressor shall be plumbed to the air brake system to maintain air pressure.

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of cab over the wheel well.

ELECTRICAL INLET

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

Amp Draw Reference List:

Kussmaul 40 LPC Charger - 5 Amps
Kussmaul 40/20 Charger - 8.5 Amps
Kussmaul 80 LPC Charger - 13 Amps
Kussmaul EV-40 - 6.2 Amps
Blue Sea P12 7532 - 7.5 Amps
Iota DLS-45/IQ4 - 11 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps
120V Dometic HVAC - 15 Amps

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner and the air pump.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a yellow cover.

HEADLIGHTS

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels. Each lamp shall include a heating system that de-ices the headlight.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00 inch X 6.00 inch amber LED with clear lens turn signals which shall be installed in an outboard position within the front fascia chrome bezel.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) Tecniq S170 LED side marker lights which shall be provided just behind the front cab radius corners. The lights shall be amber with chrome bezels.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) Tecniq S170 LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level. The lights shall be amber with chrome bezels.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled via a virtual button on the Vista display. There shall be a virtual dimmer control on the Vista display to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights when the ignition switch is in the "On" position and the parking brake is released.

CORNERING LIGHTS

The chassis shall include two (2) Whelen 500 Series TIR6™ Super-LED® steady-on cornering lights with clear lenses mounted vertically, one (1) each side.

CORNERING LIGHTS ACTIVATION

Each cornering light head shall illuminate when the respective side turn signal is activated, as well as when the transmission is placed in reverse.

CORNERING LIGHTS LOCATION

Each cornering light head shall be located on the bumper tail, one each side, centered top to bottom and rearward of any components specified bumper tail location.

INTERIOR OVERHEAD LIGHTS

The cab shall include a LED dome lamp located over each door. The lights shall include push switches on each lamp to activate both the clear and red portions of the light individually.

INTERIOR OVERHEAD LIGHTS ACTIVATION

The clear portion of each lamp shall be activated by opening the respective door and via the multiplex display.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar shall be provided and installed by the chassis manufacturer. The light bar installation shall include a lowered mounting that shall place the light bar just above the junction box and wiring to a control switch on the cab dash. The junction box on the roof with the light bar electrical connections shall be painted the same color as the cab roof in the area of the light bar.

CAB FRONT LIGHTBAR MODEL

The cab shall be provided with one (1) Whelen model F4N72 light bar. The light bar shall be 72.00 inches in length and feature eighteen (18) customizable pods.

See the light bar layout for specific details.

LIGHTBAR SWITCH

The light bar shall be controlled through a virtual button on the vehicle display and control screen. There shall be an additional button located on the vehicle display and control screen to control the clear lights.

FRONT SCENE LIGHTS

The front of the cab shall include one (1) HiViz model FireTech FT-B-65 LED scene light installed on the brow of the cab.

The housing shall be powder coated white.

FRONT SCENE LIGHT LOCATION

There shall be one (1) scene light mounted center on the front brow of the cab.

FRONT SCENE LIGHTS ACTIVATION

The front scene lighting shall be activated by a virtual button on the vehicle display and control screen.

SIDE SCENE LIGHTS

The side of the cab shall include two (2) Firetech model FT-GSMJR Guardian Elite Junior LED scene lights, one (1) each side which shall be surface mounted with a chrome bezel.

SIDE SCENE LIGHT LOCATION

The scene lighting located on the left and right sides of the cab shall be mounted in the upper forward portion of the cab between the front and rear crew doors.

SIDE SCENE ACTIVATION

The scene lights shall be activated by two (2) virtual buttons on the vehicle display and control screen(s), one (1) for each light, and by opening the respective side cab doors.

GROUND LIGHTS

Each door shall include a Tecniq T44 LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

GROUND LIGHTS

The ground lighting shall be activated when the parking brake is set, by the opening of the door on the respective cab side, through a virtual button on the vehicle display and control screen, and when the truck is placed into reverse.

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a Tecniq T44 LED light which shall activate with the opening of the respective door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

INTERMEDIATE STEP LIGHTS

The intermediate step well area at the front doors shall include a TecNiq D06 LED light within a chrome housing. The front egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with entry step lighting.

ENGINE COMPARTMENT LIGHT

There shall be a LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall activate automatically when the cab is tilted.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red TecNiq K50 LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be located centered left to right for greatest visibility.

The light and alarm shall be interlocked for activation when either a cab door is not firmly closed, or an apparatus compartment door is not closed, and the parking brake is released.

MASTER WARNING SWITCH

A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled "E Master" for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the "ON" position when the master switch is activated shall automatically power up.

HEADLIGHT FLASHER

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.

HEADLIGHT FLASHER SWITCH

The flashing headlights shall be activated through a virtual button on the Vista display and control screen.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen 600 series Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

INBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the inboard positions shall be red.

FRONT WARNING SWITCH

The front warning lights shall be controlled through a virtual control on the vehicle display and control screen. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen 600 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red.

INTERSECTION WARNING LIGHTS LOCATION

The intersection warning lights shall be recess mounted within the flat surface of the steel channel bumper's angled front right and left corners.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen 600 series Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through a virtual button on the vehicle display and control screen. This button shall be clearly labeled for identification.

INTERIOR DOOR OPEN WARNING LIGHTS

The interior of each door shall include one (1) 15.87 inch long X 0.73 inch tall amber Weldon LED warning light. The light shall be located on the upper portion of the door frame to be visible when a person is standing in front of the door while entering or exiting the cab. Each light shall activate with a scrolling directional flash pattern which moves from inside to outside when the door is in the open position. This shall serve as a warning to oncoming traffic.

SIREN CONTROL HEAD

A Whelen 295HFS2 electronic siren control head with remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature

200-watt output, hands free mode and shall be in “standby” mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

STEERING WHEEL HORN BUTTON SELECTOR SWITCH

A virtual button on the Vista display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button.

AUDIBLE WARNING LH FOOT SWITCH

Two (2) foot actuated switches shall be supplied for installation in the front section of the cab for driver actuation. One (1) switch shall be wired to actuate the air horn(s) and one (1) switch the mechanical siren(s).

AIR HORN FOOT SWITCH LH

The air horn foot switch shall be a Linemaster model 491-S.

AIR HORN FOOT SWITCH LH LOCATION

The air horn foot switch shall be located on the left hand side accessible to the driver between the steering column and the door.

AIR HORN FOOT SWITCH LH POSITION

The air horn foot switch shall be positioned inboard of any other foot switch, if applicable.

MECHANICAL SIREN FOOT SWITCH LH

The mechanical siren foot switch shall be a Linemaster model 491-S.

MECHANICAL SIREN FOOT SWITCH LH LOCATION

The mechanical siren foot switch shall be located on the left hand side accessible to the driver between the steering column and the door.

MECHANICAL SIREN FOOT SWITCH LH POSITION

The mechanical siren foot switch shall be positioned outboard of any other foot switch, if applicable.

AUDIBLE WARNING LH FOOT SWITCH BRACKET

A 30.00 degree angled foot switch bracket, wide enough to accommodate (2) foot switches, shall be installed outboard of the steering column for specified driver accessible foot switch activations.

AIR HORN AUXILIARY ACTIVATION

The air horn activation shall be accomplished by two (2) lanyard cables, one (1) on the left hand side accessible to the driver and one (1) on the right hand side accessible to the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION

The mechanical siren shall be actuated by a black push button in the switch panel on the dash. Two (2) red push button siren brake controls in the switch panel on the dash.

MECHANICAL SIREN INTERLOCK

The siren activation shall be interlocked with the park brake and shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

A twenty eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th tank level.

One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant

temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.

The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:

RED INDICATORS

Stop Engine - indicates critical engine fault

Air Filter Restricted - indicates excessive engine air intake restriction

Park Brake - indicates parking brake is set

Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened

Low Coolant - indicates critically low engine coolant

Cab Tilt Lock - indicates the cab tilt system locks are not engaged.

AMBER INDICATORS

Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault

Check Engine - indicates engine fault

Check Transmission - indicates transmission fault

Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault

High exhaust system temperature – indicates elevated exhaust temperatures

Water in Fuel - indicates presence of water in fuel filter

Wait to Start - indicates active engine air preheat cycle

Windshield Washer Fluid – indicates washer fluid is low

DPF restriction - indicates a restriction of the diesel particulate filter

Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator

Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur.

SRS - indicates a problem in the supplemental restraint system

Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring attention.

GREEN INDICATORS

Left and Right turn signal indicators

ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system

High Idle - indicates engine high idle is active.

Cruise Control - indicates cruise control is enabled

OK to Pump - indicates the pump is engaged and conditions have been met for pump operations

Pump Engaged - indicates the pump transmission is currently in pump gear
Auxiliary Brake - indicates secondary braking device is active

BLUE INDICATORS

High Beam indicator

AUDIBLE ALARMS

Air Filter Restriction
Cab Tilt Lock
Check Engine
Check Transmission
Open Door/Compartment
High Coolant Temperature
High or Low System Voltage
High Transmission Temperature
Low Air Pressure
Low Coolant Level
Low DEF Level
Low Engine Oil Pressure
Low Fuel
Seatbelt Indicator
Stop Engine
Water in Fuel
Extended Left/Right Turn Signal On
ABS System Fault

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.

AUXILIARY SPEEDOMETER

The right hand side vehicle display and control screen shall include an auxiliary speedometer with a digital readout.

RADIO

A Jensen brand heavy-duty radio with weather band, AM/FM stereo receiver and Bluetooth capabilities shall be installed in a customer specified location. Radio shall be the current, commercially available heavy-duty single-DIN automotive model at time of vehicle manufacturing date.

RADIO LOCATION

The radio shall be installed in the left hand overhead position above the driver.

AM/FM ANTENNA

A small antenna shall be located on the left hand side of the cab roof for AM/FM and weather band reception.

RADIO SPEAKERS

There shall be two (2) speakers installed in the front portion of the cab recessed overhead and two (2) speakers installed in the rear portion of the cab overhead. The speakers shall be provided for connection to the sound system.

RADIO CUTOFF

The radio shall cut-out with activation of a virtual button on the vehicle control and display screen.

CAMERA

An FRC branded inView 360-HD™ heavy duty 360° camera system powered by SEON shall be supplied. Three (3) HD cameras with box shaped housing shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear and sides of the vehicle and one (1) HD camera shall be mounted on the front of the cab, above the windshield.

The system shall provide a dual camera view. One (1) view shall be a stitched bird's eye 360.00 degrees view around the truck and one (1) shall be a direct feed from a single camera. This feed shall display the rear camera when the transmission is placed in reverse, the left or right camera with the activation of the respective side turn signal, or the front camera at all other times.

The camera system shall be integrated with an event recording system.

CAMERA DISPLAY

The camera system shall be wired to a 7.00 inch flip down HD monitor which shall include a color display and day and night brightness modes installed above the driver position.

COMMUNICATION ANTENNA

An antenna base, for use with an NMO type antenna, shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna base shall be an Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be chassis builder supplied.

COMMUNICATION ANTENNA CABLE ROUTING

The antenna cable shall be routed from the antenna base mounted on the roof to the area behind and underneath the right hand front seat.

AUXILIARY COMMUNICATION ANTENNA

An auxiliary antenna base, for use with and NMO type antenna, shall be installed on the cab. The antenna base shall be an Antenex model MABVT8 and shall include 17.00 foot of RG58 A/U cable with

no connector at the radio end of the cable. The antenna shall be mounted on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna base shall be chassis builder supplied.

AUXILIARY COMMUNICATION ANTENNA CABLE ROUTING

The auxiliary antenna cable shall be routed from the antenna base mounted on the roof to the area behind and underneath the right hand front seat.

ADDITIONAL COMMUNICATION ANTENNA

An auxiliary antenna shall be installed on the cab. The antenna shall be a Mobile Mark model SMW-302 multi band, three (3) cables, Cellular, AWS/UMTS and GPS. The antenna part number shall be SMW-302-3B-3C-2C-WHT-180 and shall include 15.00 foot cables. The antenna shall be mounted in the outboard position on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna shall be chassis builder supplied.

ADDITIONAL COMMUNICATION ANTENNA CABLE ROUTING

The additional antenna cable shall be routed from the antenna base mounted on the roof to the area behind and underneath the right hand front seat.

TWO-WAY RADIOS

A radio wire conduit with a pull wire included shall be installed and routed from behind the dash to under the officer's seat for radio installation by the customer. The officer's under seat storage area shall include an access hole for the conduit cut into the rear face of the seat box. The hole shall be approximately 1.00 inch from the bottom and 1.00 from the inner wall of the seat box.

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

ROAD SAFETY KIT

The cab and chassis shall include one (1) emergency road safety triangle kit.

DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

WARRANTY

Purchaser shall receive a Custom Chassis Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0102. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

CHASSIS OPERATION MANUAL

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

- (1) Hard copy of the Engine Operation and Maintenance manual with digital copy
- (1) Digital copy of the Transmission Operator's manual
- (1) Digital copy of the Engine Owner's manual

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.

SALES TERMS

The sale of the chassis shall be governed by the terms contained on the Sales Terms – Acceptance of Purchase Order document, a copy of which is attached to this option.

DRIVELINE LAYOUT CONFIRMATION

During the design phase of the chassis the Spartan Chassis driveline engineer shall submit the driveline layout to an OEM engineer to review the chassis design for any potential problems integrating the OEM body to the chassis. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released.