U.S.D.A. Forest Service
National Technology And Development Center, San Dimas

Hotshot Superintendent Vehicle Apparatus Body Only Specification

Issue Date: February 2016

Supersedes: January 2015

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Record of Revisions

Date	Revision Summary
January 2012	• Initial Release
January 2015	• Added Table of Contents • Added Record of Revisions since January 2012 • Clarified type of antenna mount • Clarified radio pre-wire requirements • Clarified controls and switches on center console • Clarified specifications for bug screen • Revised exhaust system requirements • Added style type for trailer connector • Added grab handles to cab rack/light bar mount • Specified locations of fuel pump & fill nozzle for fuel transfer tank • Added fold down steps to front bulkhead • Revised standard vehicle markings • Revised warranty to eight years
February 2016	• Updated Format • Revised Zone A/B/D Lightbar • Completed Section 508 updates to specification
Future Revisions	• This space reserved for future revisions

1 — General

1.1 General Statement

1.1.1 The utility body described in this specification shall be mounted on Government furnished cab and chassis. Government furnished cab and chassis shall be picked up by the apparatus manufacturer at designated locations. The apparatus manufacturer shall be liable for all loss and damage to Government furnished cab and chassis until completion and final acceptance of work and returned to the Government.

1.2 NFPA 1906

1.2.1 The completed apparatus described in this specification shall be compliant with the requirements of NFPA 1906, latest edition, except where noted.

1.3 Minimum Specification

1.3.1 This is a minimum specification. Additional requirements such as utility body suspension and body/chassis protection requirements may be specified by the Government.

1.4 Tilt Test

1.4.1 The apparatus shall be tilted to 30° minimum before lifting a tire or tire set when tested at the estimated in-service weight in accordance with NFPA 1906. The estimated in-service weight includes a slip-on unit or ATV if so equipped after delivery to the Government.

1.5 Departure Angle

1.5.1 The departure angle shall be 20° minimum when loaded as specified.

1.6 Ground Clearance

1.6.1 Ground clearance of the apparatus body shall be 26 inches minimum.

1.7 Brand Name or Equivalent Products

1.7.1 Products equivalent to the brand name components specified herein shall be approved in writing by the government prior to contract award and documented in the resultant contract.

1.8 Slip-On Unit

1.8.1 A slip on pump unit may be installed. It shall be a 50 gallon unit meeting USDA Forest Service national standard, Type 7 slip on specifications.

2 — Chassis Electrical Requirements

To be installed on Government furnished cab and chassis:

2.1 Master Body Disconnect Switch

2.1.1 One master body disconnect switch shall be provided in the cab. The switch shall be rated for 175 amps continuous duty and 800 amps intermittent duty. The switch shall be labeled “ON/OFF” and shall be located on the floorboard to the left side of the driver's seat. It shall be placed as far aft as possible to prevent accidental actuation. The exposed terminals shall be protected from damage and inadvertent contact. When in the “OFF” position, all electrical power to the apparatus fire package shall be off. Power to the chassis shall remain separate from this switch. A Cole Hersee™, Model #M-2484-16, with Model #82065 switch plate “ON/OFF” label meets this requirement.

2.2 Back Up Alarm

2.2.1 One solid state back up alarm shall be provided at the rear of the apparatus, protected from impact and debris. The back-up alarm shall be wired to the reverse circuit of the transmission, and shall provide an audible alarm to the rear of the apparatus when reverse gear is selected. The alarm shall have a volume of 87 to 112 decibels while in operation.

2.3 Map Light

2.3.1 One flexible goose neck map light shall be provided on the officer's side of the cab center console. The switch for the map light shall be located on the light and shall include a diffuser to prevent glare at night.

2.4 Antenna

2.4.1 One antenna NMO Type ¾-inch brass mount with rain cap installed shall be supplied and mounted on the cab roof as specified. The antenna cable shall be routed to the cab interior, terminating at location of radio mounting bracket.

2.5 Radio Pre-Wire

2.5.1 The chassis cab interior shall be wired with battery 12-volt DC power, battery ground, OEM ignition switched power, and radio rebroadcast wires to the siren or PA, and labeled to simplify USFS radio installation.

3 — Traffic Warning Systems

3.1 Traffic Warning System

3.1.1 The following traffic warning systems shall be provided and installed on the completed apparatus by the apparatus builder:

3.2 Electronic Siren

3.2.1 One 100/200 Watt full function electronic siren controller shall be provided. The siren control head shall have electronic air horn, public address mode, wired microphone and contain electronic siren tones of wail, yelp and Hi-Lo. The control head shall be mounted in the rearward position of the cab center console. A Federal Signal™ model PA300-MSC electronic siren meets this requirement.

3.3 Speaker

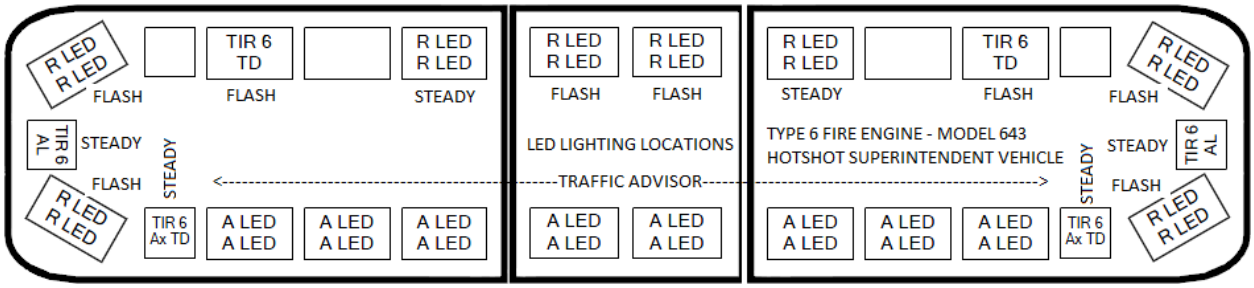
3.3.1 One 100 watt siren speaker shall be provided and installed in a protected forward facing location. The wiring for the speaker shall be routed to the electronic siren controller. A Federal Signal™ model MS100 siren speaker meets this requirement.

3.4 Forward Upper Zone A/B/C/D Light Bar

3.4.1 One L.E.D. lightbar shall be provided and installed on the cab roof, facing forward. The light bar shall be 55 inches wide, and shall contain eight flashing L.E.D. modules and six steady L.E.D. modules. L.E.D. lighting locations and filter placement shall conform to the diagrams in this section (below) and consist of: Four 45-degree corner-position red flashing modules with red lens/filters; two forward-facing, flashing white takedown modules with clear lens/filters; two forward-facing, flashing red modules with red lens/filters; two forward-facing, steady red modules with red lens/filters; two steady clear alley lights; and two steady clear rear-facing scene lights. An eight lamp amber L.E.D. Traffic Advisor® shall be installed as an integral component of the lightbar and wired to a separate Traffic Advisor® control head. A Whelen™ brand Freedom IV® L.E.D. lightbar part number F4W2RRRR-USFS6SUPT, or equivalent meets this requirement.

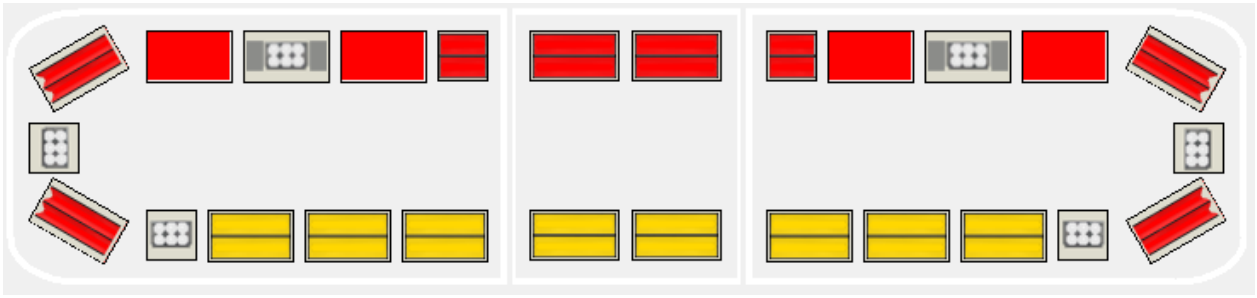
3.4.2 The light bar shall be wired to the “Emergency Master” switch located on the cab center console. The two forward facing “takedown” modules shall be interlocked with the application of the emergency brake, placing the apparatus in blocking mode and disabling the modules as such.

3.4.3 Diagram — L.E.D. Lighting Locations and Flashing/Steady Configuration



3.4.4 Diagram — Lightbar Filter Locations and Colors

3.4.5 Diagram — Lightbar Colors



3.5 Lower Zone A Warning Lights

3.5.1 Two red L.E.D. warning lights, with mounting flanges, shall be provided at on the front of the apparatus, forward facing, one per side, in the brush guard. The lights shall be wired to the “Emergency Master” switch located on the cab center console. A Whelen™ brand, 500 Series red L.E.D. flasher or equivalent shall be installed.

3.6 Forward Zone B/D Warning Lights

3.6.1 Two red L.E.D. warning lights, with mounting flanges, shall be provided on the front corners of the apparatus chassis, side facing, one on each side. The lights shall be programmed in a triple flash mode. The lights shall be wired to the “Emergency Master” switch located on the cab center console. A Whelen™ brand, 400 Series red L.E.D. flasher or equivalent shall be installed.

3.7 Aft Lower Zone C Warning Lights

3.7.1 Two amber L.E.D. warning lights, with mounting flanges, shall be provided on the lower rear of the apparatus, rear facing, one on each side. The lights shall be located in the bottom position of a four-position bezel at the rear of the body with the DOT lights. The lights shall be wired to the “Emergency Master” switch located on the cab center console. A Whelen™ brand, 700 Series amber L.E.D. flasher or equivalent shall be installed.

4 — Chassis Additions and Modifications

4.1 Additional Equipment

4.1.1 The following additional equipment shall be installed on, and modifications performed to, the specified cab and chassis by the apparatus manufacturer:

4.2 Apparatus Fluid Types and Quantities

4.2.1 A permanently-mounted label, showing the recommended fluid types and quantities for the apparatus chassis and associated components, shall be provided in the apparatus cab interior near the driver's seating position.

4.2.2 This label shall list the recommended fluid types and quantities for the following components:

- Chassis Engine Lubricant
- Chassis Engine Coolant
- Chassis Power Steering Fluid
- Chassis Transmission Fluid
- Chassis Transfer Case Lubricant
- Chassis Drive Axle Lubricant
- Chassis Brake Fluid

4.3 Seating Capacity

4.3.1 A warning label, listing the seating capacity of the completed apparatus, shall be provided in the apparatus cab interior. This label shall be located so that it is visible from all seating positions.

4.3.2 This apparatus shall have a seating capacity of two personnel in front, and three personnel in the rear for a total seating capacity of five.

4.4 Seat Belt Warning

4.4.1 A warning label, stating: “DANGER- Personnel Must Be Seated And Seat Belts Must Be Fastened While Vehicle Is In Motion Or DEATH OR SERIOUS INJURY MAY RESULT,” shall be provided in the apparatus cab interior. This label shall be located so that it is visible from all seating positions.

4.5 Vehicle Height Warning

4.5.1 A warning label, listing the overall height, length and GVWR of the completed apparatus, shall be provided in the apparatus cab interior. This label shall be located so that it is visible from the driver's seating position.

4.6 Final Stage Manufacturer Vehicle Certification

4.6.1 A Final Stage Manufacturer vehicle certification label shall be provided and installed in the apparatus cab driver's door jamb.

4.7 Noise Hazard Warning

4.7.1 A warning label, stating: “WARNING: Noise Hazards Occur During Siren Operation,” shall be provided and installed in the apparatus cab interior. This label shall be located so that it is visible from all seating positions.

4.8 Air Filter Ember Protection Screen Warning

4.8.1 A warning label, stating: “This apparatus is equipped with an air filter ember protection screen; routine inspection is required” shall be provided and installed in the apparatus cab interior. This label shall be located so that it is visible from the driver's seating position.

4.9 Cab Console

4.9.1 The cab shall be equipped with an angled front, form-fitted control console located between the front driver's and officer's seats. This console shall be sized to accommodate the installation of a switch panel for the control of the emergency and general illumination lighting, siren controller, traffic advisor control head, and customer-mounted radios. The switch panel shall consist of a five switch multiplex module with lighted switches. The switch module shall have back lighted identification plates on a non-glare panel surface. The switch panel shall be illuminated whenever the master switch is in the “ON” position. Panel light brightness shall dim automatically via the multiplexing system when the chassis headlights are turned on. The cab console shall be fabricated from steel, and painted with a powder-coated black finish.

4.9.2 The following controls and switches shall be positioned from forward to aft on the center console as follows:

- One flexible map light
- One faceplate and pre-wiring for Government-mounted Bendix King radio
- Two microphone clip brackets, mounted on driver's side
- One switch panel with five switches
- One electronic siren controller
- One traffic advisor control head
- One 2 position cup holder
- One 4 position 12-volt power outlet
- One 6-inch storage compartment
- One RED low battery indicator light

4.9.3 The switch panel shall contain a total of five switches with pilot lights, numbered and function labeled, configured from left to right as follows:

- (1) Emergency Master
- (2) Take Down
- (3) Scene Lights
- (4) Left Alley
- (5) Right Alley

4.10 Front Bumper with Brush Guard

4.10.1 A heavy duty black powder coated finish bumper and brush guard assembly shall be provided and installed on the front of the apparatus. The complete assembly shall follow the chassis body lines and encompass the perimeter of the chassis front. The complete assembly shall be of such design that the guard will not vibrate, and shall provide a solid mounting area for warning lights, speakers, or other specified equipment. The bumper shall accommodate the OEM driving lights.

4.11 Rear Bumper

4.11.1 The rear bumper shall be a minimum of 3 inches tall by 8 inches deep and extend across the width of the apparatus body. The bumper shall be fabricated from heavy duty steel tubing, and shall be painted black. The top of the bumper shall be perforated skid resistant surface or NFPA compliant skid resistant tread plate surface. The bumper shall protect the apparatus body.

4.11.2 The rear bumper design and installation shall be such to provide for a minimum departure angle of 20 degrees.

4.12 Bug Screen

4.12.1 A bug screen shall be installed in the front grill to help protect the radiator from damage or blockage caused by insects and small pieces of road debris. The screen shall be 8 by 8 mesh size (60% opening); 0.097-inch opening and 0.028-inch diameter wire mesh and shall not restrict air flow to the chassis cooling system.

4.13 Mud Flaps

4.13.1 One pair of flexible rubber mud flaps shall be provided on both sides of the apparatus body behind the rear wheels. The mud flaps shall not bear company logo.

4.13.2 The mud flaps shall extend down far enough to be effective but shall not allow the flaps to become entangled with the rear tires when the apparatus is backing up.

4.14 Exhaust System

4.14.1 The exhaust system shall extend beyond the exterior of the body per OEM chassis recommendations. The exhaust system shall be mounted in a horizontal configuration under the passenger's side of the cab.

4.15 Fuel Hose and Electrical Harness Protection

4.15.1 If applicable, any fuel lines or electrical harnesses below the chassis frame rails shall be protected with a fire proof sleeve designed specifically for such purpose.

4.16 Chassis Air Intake Ember Guard

4.16.1 The chassis air intake shall be protected by an ember guard of 18 mesh, 0.017-inch wire diameter, and a maximum mesh opening of 0.039 inches. The ember guard shall not decrease existing surface area. It shall be sized to fit, and located at the intake opening. The screen shall be readily accessible for inspection and maintenance.

4.17 Cabin Air Ember Guard

4.17.1 The cabin air filter shall be protected by an ember guard with a maximum mesh opening of 0.039 inches. The screen shall be located at the point of intake and easily accessible for inspection and maintenance.

4.18 Chassis Component Protection

4.18.1 Aftermarket skid plates shall be installed to protect as a minimum the radiator system and the diesel emissions fluid (DEF) tank. The skid plates shall be constructed of powder-coated 1-inch diameter 0.095 minimum wall thickness tubular steel. Skid plates shall attach to existing chassis mounting points and shall be readily removable for maintenance. Baja Fabrication & Shock Works skid plates meet this requirement.

4.19 Hitch Receiver

4.19.1 A Class IV frame-mounted 2-inch hitch receiver shall be provided. The receiver shall not reduce the angle of departure.

4.20 Trailer Electrical Connection

4.20.1 A 7-way round pin trailer connector shall be provided at the rear of the apparatus in proximity to the hitch receiver. Chassis OEM provided electrical connections shall be utilized for the connector.

5 — Apparatus Body Description

5.1 Fire Apparatus Body

5.1.1 The body shall be designed for fire/rescue service operations only, and shall be constructed to withstand off-road use. The body must be of sufficient design to be capable of withstanding the twisting and abnormal flexing, stresses and other occupational hazards caused by traveling on unimproved mountainous and rangeland roads. No commercially designed bodies intended for use in other vocations or applications are acceptable in quality, construction, design or longevity.

5.1.1 The apparatus body shall be constructed from galvanneal steel.

5.1.2 The installation of hardware parts such as hinges, catches, handles, or knobs shall be accomplished to avoid damaging the hardware or the mounting surface. After fabrication, all parts shall be cleaned of the following: smudges; loose, spattered, or excess welding; metal chips or fillings; or any other foreign material which might detract from the intended operation, function, or appearance of the apparatus or its equipment. This would include any particles which could loosen or become dislodged during the normal expected life of the equipment. Whenever possible, this cleaning shall take place before the parts are assembled.

5.1.3 Threaded parts or devices shall show no evidence of cross-threading, mutilation, or detrimental burrs. All screw type and rivet fasteners shall be tight to allow no relative movement between the attached parts. All bolts and screws shall not be tightened in excess of the SAE torque standard established for the grade, screw, and thread type.

5.2 Apparatus Body

5.2.1 The entire apparatus body shall be an independent structure and shall be removable in its entirety without the disassembly of any compartments, flooring, or other structural components.

5.2.2 The body shall be designed to be approximately as wide as the outside wheel track on the rear axle. This will allow the apparatus to maneuver more easily in off-road environments. The body shall be approximately 94 inches wide from side to side at the rear of the apparatus.

5.2.3 Each compartment shall have a ¾-inch drain located in the rear of the compartment fitted with an easily removable rubber grommet closure.

5.2.4 The apparatus body shall be fabricated of a minimum of 12 gauge structural steel cross-members, providing structural support.

5.2.5 Deck shall be constructed of a minimum of ⅛-inch diamond plate steel. Exterior and

interior panels shall be constructed of a minimum of 18 gauge galvanneal steel. This shall provide a strong, corrosion free structure that will withstand the rigors of wildland fire operations.

5.2.6 All materials used in the construction of the body shall be treated with a corrosion-preventing coating.

5.2.7 The deck width shall be 54 inches wide with no wheel well intrusions.

5.3 Body Frame Construction

5.3.1 The apparatus body and compartments shall be supported with a frame constructed of commercial grade steel channel or tubular steel members. The frame shall extend under the wheel well areas at the front and rear and shall be attached to the compartments. The cross-members in the support system shall be spaced so that there is no more than ¼-inch of vertical deflection per 256 square inches when 250 lbs. is evenly distributed over 40 square inches. The frame shall be constructed to become an integral portion of the apparatus body. The channel or tubular steel deck and compartment support frames shall be strong enough to support 5000 pounds in the bed area and 1000 pounds of equipment in each side compartment (the actual load capability of the completed apparatus may be limited by the GVWR)

5.4 Body Mounting

5.4.1 A spring loaded body mounting system shall be used to mount the body to the chassis. This system shall be designed to allow independent movement between the body frame and the chassis frame protecting the module from the stresses and twisting rendered by the flexing of the chassis frame. The mounts shall be pre-engineered for their intended use.

5.4.2 The mounting hardware (nuts, bolts, washers) required for complete body installation shall be Grade 8 for sizes ½-inch and smaller, and Grade 5 for sizes larger than ½-inch. All nuts shall be self-locking style. All mounting brackets shall be painted black.

5.4.3 The body front shall be mounted utilizing springer type mounts. The rear body mounts shall be affixed via solid mounts to the chassis frame.

5.5 Vertical Surfaces

5.5.1 The entire vertical surfaces at the front and rear bulkhead of the body, and the top horizontal surface of the body, forward of the cargo racks, shall be covered with a minimum ⅛-inch thick polished aluminum tread plate for appearance, wear, and enhanced visibility at night. The tread plate shall be designed so that joints are minimized and shall cover the entire vertical surface area. The tread plate shall also incorporate protection of the outboard corners and serve as corner scuff guards.

5.6 Grab Handles

5.6.1 Two 10-inch NFPA-compliant chrome-plated grab handles shall be provided and located at the rear of the body, one mounted vertically on each side of the rear-facing surface of the upper compartment.

5.6.2 Two 18-inch NFPA-compliant chrome-plated grab handles shall be provided and located on the cab rack and light bar mount, one mounted on each side of the rack.

5.7 Rear Warning Plate

5.7.1 One warning plate shall be affixed to the rear of the apparatus body in a conspicuous location. The warning plate shall read “WARNING: DO NOT RIDE ON REAR BUMPER WHILE VEHICLE IS IN MOTION. DEATH OR SERIOUS INJURY MAY RESULT.”

5.8 Compartmentation

5.8.1 Compartment configuration and approximate sizes required are listed below:

5.8.1.1 Apparatus body height: 40 inches

Compartment depth: 20 inches

5.8.2 Driver's side compartment configuration:

- Forward vertical compartment: 36 inches wide, vertically hinged, hinged side toward front of apparatus body
- Horizontal compartment over wheel well: 45 inches wide by 18 inches high, horizontally hinged, drop-down door
- Aft vertical compartment: 27 inches wide, vertically hinged, hinged side toward rear of apparatus body

5.8.3 Passenger's side compartment configuration:

- Forward vertical compartment: 35 inches wide, vertically hinged, hinged side toward front of apparatus body
- Horizontal compartment over wheel well: 73 inches wide by 18 inches high, horizontally hinged, drop-down door
- Lower rear vertical compartment: 27 inches wide by 22 inches high, vertically hinged, hinged side toward rear of apparatus body

5.9 Compartment Doors

5.9.1 All compartment doors shall be integral in design and recessed into the apparatus body sides, sized to provide easy access to all interior areas of the compartment. All doors shall be consistent in fit and finish with the apparatus body. All doors shall be weatherproof and maintain contact with all points of the weather stripping. Weather stripping shall be bulb type, attached to the opening flange of the compartment opening.

5.9.2 Red/white reflector DOT striping shall be installed on the interior surface of all vertically hinged doors.

5.9.3 Inside door panels shall be painted or powder coated to match exterior body surfaces.

5.10 Door Latches and Hardware

5.10.1 Unless where noted, all compartment door latch assemblies shall be installed with threaded fasteners, shall not be welded, and shall be easily removable for servicing or replacement. All latches shall be of a slam-type design, with a single-point latching operation. Matching striker bolts shall be utilized with all latch assemblies. All striker bolts shall have slotted mounting holes, and shall be attached with bolts to captive steel plates in the body structure for strength and ease of adjustment. Welded striker bolts or plates shall not be acceptable.

5.10.2 All hardware shall be corrosion resistant and suitable for its intended use. All nuts and bolts shall be stainless steel. Stainless steel nuts shall be the self-locking type. All latch assemblies shall be keyed alike to 1250. All compartment locks for a given engine shall be either vertical or horizontal when locked so that it is visually apparent whether or not a compartment is locked or unlocked. Ten spare keys shall be provided.

5.10.3 All door latch assemblies shall be of a flush-mount, “D-Handle” two step design, with all external components fabricated from polished stainless steel.

5.11 Door Hold Open Devices

5.11.1 All vertically-hinged, outward-opening compartment doors shall be provided with an over center door check to hold the door in the desired position. The door check shall be attached to the top of the door and fastened to a stainless steel plate bolted into the body and door.

5.11.2 All vertically-hinged, outward opening compartment doors shall be capable of being closed with one hand, allowing a free hand to hold equipment or supplies.

5.11.3 All horizontally-hinged, drop-down, outward-opening compartment doors shall open to a 90° angle. They shall be supported by a minimum of 3⁄32-inch aircraft-type stainless steel cable with stainless steel fork ends, or heavy duty steel chain with sheath. The fork ends shall be attached at each end to a stainless bracket so that the cable can hinge as the door is closed.

5.12 Adjustable Shelf Channels

5.12.1 Vertically-mounted steel Unistrut™ channels shall be provided and installed in all enclosed body compartments, except passenger's side lower rear compartment, for the current or future installation of infinitely-adjustable shelving, slide out trays or equipment brackets.

5.13 Tailgate

5.13.1 A 12-inch high fold down rear tailgate shall be provided. The inner surface of the tailgate shall be steel tread plate. The tailgate shall overlap the rear vertical body surfaces such that the tailgate does not reduce the length of the deck when closed. No advertising shall be permitted.

5.14 Compartment Shelves

5.14.1 Seven adjustable shelves shall be provided and installed in the completed body compartments. The shelf locations shall be as follows:

- Two in the driver's side forward vertical compartment
- Two in driver's side aft vertical compartment
- Two in the passenger's side forward vertical compartment
- One in the passenger's side horizontal compartment

5.14.2 No shelving in passenger side lower rear vertical compartment, or driver's side horizontal compartment.

5.15 Compartment Venting

5.15.1 Venting shall aid in air circulation and reduce moisture and fumes caused by fuel storage. All compartments shall be vented on the back wall with louvered vents on the vertical surface of the bed.

5.16 Compartment Floor Mats

5.16.1 All enclosed side body compartments shall have floor mats installed in them, custom cut to fit the compartment floors. The floor mats shall be black in color and shall be easily removable to allow the compartment to be cleaned. The floor mats shall be designed to provide ventilation to the equipment stored in the compartment, and to protect the stored equipment from direct contact with the metal compartment floor surfaces. Turtle Tile brand floor mats meet this requirement.

5.17 Rear Cab Rack and Light Bar Mount

5.17.1 One cab rack to mount the light bar shall be fabricated and installed at the forward end of the apparatus body, directly behind the cab. The horizontal top bar and upright legs of the rack shall be fabricated from 2-inch by 2-inch square steel tubing welded to a ⅜-inch by 3-inch steel flat bar base. The top of the rack shall conform to the shape of the chassis cab. The rack shall include a stainless steel expanded metal bulkhead-mounted cab window guard. It shall be powder coated black.

5.18 Cargo Racks

5.18.1 Cargo racks shall be mounted on top of both utility body side packs. The racks shall be fabricated from 1-inch steel tubing with expanded metal sides. Cargo racks shall be

approximately 93 inches wide by 9 inches high by 18 inches deep. The racks shall be fabricated and mounted such that there is an approximate ¾-inch gap between the top of the surface of the body and the cargo rack frame bottom.

5.18.2 The cargo racks shall be powder coated black.

5.19 Fuel Transfer Tank

5.19.1 A fuel transfer tank shall be installed on the deck, against the forward vertical wall of the utility bed.

5.19.2 The system shall consist of a split tank or two attached tanks which hold a nominal 40 gallons of diesel and a nominal 20 gallons of gasoline. Each tank shall have a dedicated electric pump, filter/meter, vent, filler neck, cap, hose and nozzle. The system shall meet all applicable US Department of Transportation requirements.

5.19.3 The system shall be arranged so the diesel tank is on the driver's side and the gasoline tank on the passenger side, with the fuel pump and fill nozzle on the outboard side of the tanks and rear facing. Each tank shall be clearly labeled with the fuel type. All fuel pump components and plumbing shall be supported properly with brackets.

5.19.4 A Transfer Flow Inc. fuel transfer system meets these requirements.

5.20 Fold-Down Steps

5.20.1 Two NFPA-compliant fold-down steps shall be provided and installed on the front bulkhead of the apparatus to allow access to the fuel nozzle, one on each side of the body. The steps shall be fabricated from heavy duty cast aluminum with spring assisted folded hinges. The top of the steps shall be an integral diamond point skid resistant surface that allows water to flow off the step without ice formation in cold weather use. The vertical distance from the ground to the step shall not exceed 28 inches.

5.21 Spare Tire Storage

5.21.1 The spare tire shall be securely mounted vertically, immediately aft and against the fuel transfer tank on the passenger side.

5.22 Fuel Can Storage

5.22.1 A divider shall be installed to provide secure fuel can storage. The divider shall be fabricated from 0.120 wall 1-inch square or round tubing and shall be installed to provide a 13½-inch to 14-inch gap aft of the fuel transfer next to the spare tire. The divider shall be installed approximately 9 inches above the deck such that 5 gallon jerry cans will be secure. The divider shall be powder coated black.

5.22.2 There shall be a 76-inch minimum clear space from the tailgate to the fuel can storage divider for possible ATV transportation or slip on pump installation.

5.23 Cargo Tie-Downs

5.23.1 Four in-deck tie-down D-rings shall be installed flush with the utility body deck, in the four corners of the remaining deck space. Each tie-down shall have a load capacity of 2500 pounds minimum. Cargo tie-downs are not required with the installation of slip-on pump.

5.24 Deck Non-Skid Coating

5.25.1 The utility body deck shall have a protective/non-skid coating applied, black in color. The non-skid coating shall be applied to the remaining deck space and up the sidewalls 6 inches high.

6 — Body Electrical Requirements

6.1 Electrical Components

6.1.1 All apparatus body electrical components shall be served by independent circuits which shall be separate and distinct from the apparatus cab and chassis electrical circuits. All wiring supplied and installed by the apparatus manufacturer shall be installed in flexible split convoluted loom and shall be color coded and function labeled at 6-inch intervals. All wiring supplied and installed by the apparatus manufacturer shall be grease, oil and moisture resistant; and shall be securely fastened with insulated metal clamps and nylon wire ties. Solderless insulated connectors shall be utilized at all splice joints and shall be enclosed with heat shrink tubing for extra corrosion protection. Automatic reset type circuit breakers shall be provided wherever possible.

6.2 Impact Protection

6.2.1 All recessed lights shall be protected against impacts from equipment inside compartments by either aluminum guards sufficient for use, or a false bottom as applicable.

6.3 Electrical Equipment

6.3.1 The following electrical components shall be provided and installed on the completed apparatus by the apparatus builder:

6.4 Rear Dot Lighting

6.4.1 The rear DOT lighting shall consist of the following components:

6.5 Tail Lights, Brake Lights

6.5.1 A pair of red L.E.D. combination tail/brake lights shall be provided at the rear of the body, one on each side, above the rear step. Whelen™ brand, 700 Series red L.E.D. combination tail brake lights or equivalent shall be installed.

6.6 Turn Signal Lights

6.6.1 A pair of amber L.E.D. arrow style turn signal lights shall be provided at the rear of the body, one on each side, above the rear step. Whelen™ brand, 700 Series amber L.E.D. arrow style turn signal lights or equivalent shall be installed.

6.7 Back Up Lights

6.7.1 A pair of clear high intensity L.E.D. back up lights shall be provided at the rear of the body, one on each side, above the rear step. The back-up lights shall be wired so that they illuminate when the chassis is placed in reverse gear and/or when the rear scene light switch is activated in the cab. Whelen™ brand, 700 Series clear high intensity L.E.D. back up lights or equivalent shall be installed.

6.7.2 The above DOT lighting shall be provided with a vertical cast aluminum four position frame at the rear of the body, one on each side. The frames shall have a polished aluminum finish, and shall also contain the lower Zone “C” warning lights.

6.8 License Plate Bracket and Light

6.8.1 One clear light fixture, with license plate mounting bracket, shall be provided at the rear of the body.

6.9 Cluster/Clearance Lights and Reflectors

6.9.1 Three round ICC L.E.D. clearance lights shall be located at the rear of the apparatus above the bumper.

6.9.2 Additional lighting shall be provided to conform to DOT, Federal and NHTSA specifications for vehicles of 80 inches wide. All lighting shall be compatible with the 12 volt chassis electrical system. Lighting shall be located according to ICC regulations.

6.10 Compartment Lights

6.10.1 L.E.D. rope lighting shall be provided and installed in each exterior compartment. Full length L.E.D. rope lighting shall be installed behind the door frame on the left side, right side and top. The rope lighting shall be positively attached to the inside of the compartment and shall be easily removable for replacement or repair. No adhesive tape shall be used to mount the lights of mounting clips. The L.E.D. rope lighting provided shall be ⅜-inch diameter with a maximum spacing of 1½-inch between the light-emitting diodes. Vista Manufacturing, Inc., Flexi Round L.E.D. Rope Light, or equivalent, shall be installed.

6.10.2 Each compartment shall be equipped with one manual “push-pull” off-on waterproof marine type switch mounted in the top corner. This switch will allow for the L.E.D. strip lights to be turned on manually and off upon the door closing. Cole Hersee™, #W606, or equivalent, shall be installed.

7 — Electrical System Performance Test, Low-Voltage

7.1 Test Requirements

7.1.1 The fire apparatus low voltage electrical system shall be tested as required by this section and the test results shall be certified by the apparatus manufacturer. The certification shall be delivered to the Government with the documentation for the completed apparatus. The tests shall be performed when the air temperature is between 0° Fahrenheit and 110° Fahrenheit (18° Celsius and 43° Celsius).

7.2 Test Sequence

7.2.1 The three tests defined below shall be performed in the order in which they appear. Before each test, the chassis batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10 minutes. The failure of any of these tests shall require a repeat of the test sequence.

7.3 Reserve Capacity Test

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

7.4 Alternator Performance Test at Idle

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

7.5 Alternator Performance Test at Full Load

7.5.1 The total continuous electrical load shall be applied with the chassis engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two hours. The activation of the electrical system load management system shall be permitted during this test. The activation of an alarm due to excessive chassis battery discharge, as detected by the system required by NFPA (current edition), or an electrical system voltage of less than 11.8 volts direct current for a 12 volt nominal system, for more than 120 seconds, shall be considered a failure of this test.

7.6 Low Voltage Alarm Test

7.6.1 Following the completion of the tests described above, the chassis engine shall be turned off. With the chassis engine turned off, the total continuous electrical load shall be applied and shall continue to be applied until the excessive battery discharge alarm activates. The chassis battery voltage shall be measured at the battery terminals.

7.6.2 The test shall be considered to be a failure if the low voltage alarm has not yet sounded 140 seconds after the voltage drops to 11.70 volts direct current for a 12 volt direct current nominal system. The chassis battery system shall then be able to restart the chassis engine. The failure of the chassis battery system to restart the chassis engine shall be considered a failure of this test.

7.7 Documentation

7.7.1 The apparatus manufacturer shall provide the results of the low-voltage electrical system performance test, certified in writing, with the documentation provided to the Government at the time of delivery of the completed apparatus.

7.7.2 The test results shall consist of the following documents:

(1) Documentation of the electrical system performance tests.

(2) A written electrical load analysis, including the following:

- The nameplate rating of the alternator.
- The alternator rating under the conditions specified in NFPA 1906 (current edition).
- Each of the component loads specified that make up the minimum continuous electrical load.
- Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load.
- Each individual intermittent electrical load.

8 — Apparatus Finish

8.1 Apparatus Body Color

8.1.1 The color of the chassis cab exterior and body shall be No. 14260 of Federal Standard No. 595 (Forest Service Green).

8.2 Apparatus Body Finish

8.2.1 The compartment interiors are to be sealed for leaks and the inside surface areas cleaned and prepped, then finish painted with a durable polychromatic, modified nitrocellulose coating that is V.O.C. compliant , isocyanate and lead free. One product that meets these requirements is Zolatone™ 20 Series. Color shall be #20-11 (Apollo Gray).

8.2.2 The exterior finish of the apparatus body shall be painted or powder coated. All aluminum and stainless steel shall remain unpainted. Any unpainted steel used in the fabrication of the mounting system shall be prepared for painting following the paint manufacturer's recommendations for the preparation of the surface. Paint for all steel parts shall match the chassis cab that the apparatus is mounted upon. Paint or powder coat shall meet or exceed industry standards for color matching, durability and protection of the base material.

8.3 Vehicle Marking

8.3.1 A 4-inch wide white retro-reflective stripe shall be provided and installed horizontally on both the chassis cab and body. The stripe shall be placed as high as possible on the vertical surfaces on the sides of the chassis tilt hood and shall run the full length of the apparatus at that height. One break shall be provided in the stripping on either side of the apparatus body, approximately over the rear wheel centerline. The ends of the stripe shall be sloped on a forward slant at approximately 45 degrees on either side of the break.

8.3.2 A 4-inch wide retro-reflective stripe shall be provided and installed horizontally on the tailgate above the Hot Shot crew name.

8.3.3 Block style lettering, fabricated from retro-reflective material, shall be provided and installed on the apparatus as follows:

8.3.4 The word “FIRE,” in 4-inch tall white letters, shall be applied on both sides, centered in the 45 degree angled break of the 4-inch white reflective stripe on the compartment doors, over the rear wheels.

8.3.5 The unit designator and equipment designator (Example: CA-TNF-C11) in 6-inch tall white letters, shall be provided, on the compartment door(s) above the 4-inch white stripe, on each side of the apparatus body.

8.3.6 The unit designator, in 4-inch tall white letters, shall be provided centered on the forward-facing swept back portion of the front bumper on the passenger's side, and the equipment designator, in 4-inch tall white letters, shall be provided centered on the forward-facing swept back portion of the front bumper on the driver's side.

8.4 Decal, Crew Name and Logo

8.4.1 The Hot Shot crew name (example: Truckee Hotshots) in non-reflective black block letters shall be provided on the cab roof. The letters shall be sized appropriately allowing for maximum size given the roof area.

8.4.2 The Hot Shot crew name, in black letters, shall be provided on the outward surface of the tailgate. Crew name, height and font of letters shall be provided by the Government.

8.4.3 The Hot Shot crew logo, 14 inches maximum diameter, shall be provided on each forward vertical compartment door.

8.4.4 The apparatus manufacturer shall install Government-supplied door decals in their entirety (FOR OFFICIAL USE ONLY, US GOVERNMENT, 10-inch shield and vehicle number) below the horizontal stripe on the forward chassis cab doors. There shall be no break in the stripe on the chassis cab doors.

9 — Equipment

9.1 Completed Apparatus

9.1.1 The following equipment shall be provided with the completed apparatus. The equipment shall be new and unused, and shall meet all current NFPA, OSHA and other applicable safety regulations.

9.2 Manuals and Drawings

9.2.1 The following specified materials shall be provided with the completed apparatus:

9.2.2 One complete set of standard chassis operation, parts and service manuals.

9.2.3 One apparatus manufacturer's operation and service manual, to include:

- Manufacturer's Record of Construction
- Warranty Registration and Information
- Operator Safety Information
- Vehicle Exterior Maintenance Instructions
- Maintenance and Lubrication Information & Charts
- Complete Electrical Diagrams
- Component Literature (Example: siren, PTO, hose reel, etc.)
- Weight Certificate, Service Parts Replacement List

9.3 Road Kit

9.3.1 The completed apparatus shall be equipped with a road kit containing the following items:

9.3.2 One 2½ pound Class B/C fire extinguisher with vehicle mounting bracket, shipped loose

9.3.3 One set of warning triangle reflectors, containing three folding reflectors in a plastic storage case

9.3.4 One 6 ton hydraulic jack with handle and lug wrench

9.4 Wheel Chocks

9.4.1 Two NFPA-compliant solid bottom wheel chocks shall be provided with the completed apparatus, one on each side. Zico™ Model #AC-32-W with aluminum base plate installed or equivalent shall be provided.

9.5 Wheel Chock Mounting Brackets

9.5.1 Two wheel chock vertical mounting brackets shall be installed at the rear of the body, one mounted vertically on each side, inboard of the rear DOT lighting, above the bumper. Aluminum tread plate shall be provided above the mounting brackets to protect the paint from damage.

10 — Warranty Provisions

10.1 Eight Year Apparatus Warranty

10.1.1 All materials and workmanship herein specified, including all equipment furnished, shall be guaranteed for a period of eight years after the acceptance date of the apparatus, unless otherwise noted, with the exception of any normal maintenance services or adjustments which shall be required.

10.1.2 Under this warranty, the apparatus manufacturer shall be responsible for the costs of repairs to the apparatus that have been caused by defective workmanship or materials during this period.

10.1.3 This warranty shall not apply to the following:

- Any component parts or trade accessories such as chassis, engines, tires, pumps, valves, signaling devices, batteries, electric lights, bulbs, alternators, and all other installed equipment and accessories, in as much as they are usually warranted separately by their respective manufacturers, or are subject to normal wear and tear.
- Failures resulting from the apparatus being operated in a manner or for a purpose not recommended by the apparatus manufacturer.
- Loss of time or use of the apparatus, inconvenience or other incidental expenses.
- Any apparatus which has been repaired or altered outside of the apparatus manufacturer's factory in any way that affects its stability, or which has been subject to misuse, negligence, or accident.