USDA FOREST SERVICE

SPECIFICATION

MODEL 326

June 2010

GENERAL

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

The in-service weight shall not exceed 90% of the front axle GAWR and 20,000 lb. on the rear axle when:

- fully loaded with water, foam and fuel,
- with 270 lbs. per seat, and
- 2300 lbs. of equipment evenly distributed in the storage compartments.

TILT TEST

The apparatus shall be tested at the estimated in-service weight in accordance with NFPA 1906.

CHASSIS SPECIFICATIONS

The apparatus chassis shall be an International 7400 SBA (set back axle) with a four door crew cab and two wheel drive.

The chassis shall include the following features:

Wheelbase:

185"

Cab to Axle:

74"

Tow Hooks:

Front, two (2); inside rail; frame mounted

Frame Rails:

Heat treated alloy steel; 10.250” x 3.610” x 0.375”; 120,000 PSI yield

Bumper, Front:

Steel; swept back; powder coated Argent Gray

Frame Extension:

Integral, 20” in front of grille (to be reduced in length as needed)

Axle, Front, Non-Driving:

(Meritor MFS-14-143A); 12,000 lb. capacity

Suspension, Front:

Spring; taper leaf; parabolic; 12,000 lb. capacity; with shock absorbers

Brake System, Dual Air:

Includes:
Front brakes: 16.5" x 5"; S-Cam type; with 20 sq. in. MGM long stroke brake chambers
Rear brakes: 16.5" x 7"; with MGM TR3030 long stroke brake chamber and heavy duty spring actuated parking brake
Dust shields; front and rear axles
Slack adjusters; front and rear; automatic
Drain valve; twist type
Drain valve (Berg); manual; with chain
Gauges; located in cab instrument panel; "Air 1" and "Air 2"
Air dryer (Bendix AD-IP); with heater
Brake lines; color and size coded nylon
Parking brake valve; with yellow knob; located on cab instrument panel
Air Brake ABS: Full vehicle wheel control system (4-channel) (Bendix Antilock Brake System)
Air compressor (Bendix Tu-Flo 550); 13.2 CFM capacity
Spring brake modulator valve

Steering Column:

Tilting

Steering Wheel:

2-spoke, 18” diameter, black

Steering Gear:

Power (Sheppard M-100)

Exhaust System:

Single, horizontal; with aftertreatment device; frame mounted outside right framerail under cab, includes vertical tailpipe and guard

Electrical System:

12-volt

Includes:
Headlights; two (2); halogen
Horn; electric; single
Horn; air accommodation package; less horn
Starter switch; electric; key operated
Headlight dimmer switch integral with turn signal lever
Turn signal switch; self canceling
Windshield wiper; 2-speed; integral with turn signal switch; with wash/intermittent feature
Circuit breakers; manual reset; replaces all fuses except for 5A
Wiring; chassis; color coded and continuously numbered

Alternator:

12 VDC; 200 amp capacity (Leece-Neville 14951PA)

Battery System:

Three (3); 1950 CCA total batteries; maintenance-free; steel battery box
Jump start stud; remote mounted

Radio:

International AM/FM stereo with CD player and Weatherband; two (2) coaxial speakers

Starter:

12 VDC (Leece Neville M130D); with thermal over-crank protection

Grille:

Stationary; chrome

Front End:

Tilting, fiberglass; with rubber fender extensions

Engine:

Diesel; 50 State, 330 HP; 950 lb-ft torque @ 1200 rpm, 2200 RPM governed speed
(International Maxxforce 9)

Includes:
Air cleaner; single element
Throttle; hand control; stationary; mounted on steering wheel
Fuel/water separator and fuel filter in a single assembly, with water-in-fuel sensor and heater
Block heater; 120 volt/1250 watt (Phillips)
Fan drive (Horton Drivemaster); two speed; direct-drive
Indicator, low coolant level with audible alarm
Grille; ember screen; engine air intake system; hood-mounted
Diamond Logic combined engine and exhaust brake, Latched Mode
Expanded engine temperature effects to allow higher engine temperature operating range

Radiator:

Aluminum; cross flow; 1228 sq-in area and 1167 sq-in charge air cooler

Transmission, Automatic:

Allison 3500 EVS_P; wide ratio; 6 speed; with double overdrive; with oil level sensor; with
PTO provision; less retarder

Transmission Controls

T-bar type; for Allison 3000 and 4000 transmissions

Axle, Rear:

Single; 21,000 lb. capacity, (Meritor RS-23-160)

Includes:
Differential; locking (Detroit Locker); No-Spin
Drain plug, magnetic, for single rear axle

Suspension, Rear:

Spring; single; 23,500 lb. capacity; with 4,500 lb. auxiliary rubber spring; with shock absorbers

Fuel Tank:

Capacity: 70-gallons; steel; D style; top draw; mounted left side under cab

Cab:

Conventional 6 person crew cab

Includes:

Clearance lights; five (5); flush-mounted
Exterior grab handles; three (3); aft of cab doors; two (2) driver's side of cab; one (1)
passenger's side of cab (due to exhaust pipe); with rubber insert
Interior grab handles; seven (7); passenger's side front and both rear cab doors
Exterior cab steps; eight (8); two (2) steps per cab door

Mirrors; exterior; two (2); rectangular; 15.75"x 7.09"; with integral convex; 102" wide spacing; with breakaway type mounting brackets; with LED clearance lights
Gauge cluster English with electronic speedometer, tachometer, oil pressure, coolant temperature, fuel level, voltmeter, washer fluid level
Warning system; low fuel level, low oil pressure, high coolant temperature, low voltage
Gauge, transmission temperature
Gauge, applied air
Gauge; air cleaner restriction
Seat, driver's and passenger's; National 2000; high back; vinyl; air suspension; air lumbar
Delete rear bench seat;
Red 3 point seat belts; driver's and passenger's and outboard rear cab seats (total of four)
Red 2 point seat belt; center rear seat (total of one)
Air conditioner (International Blend-Air); with integral heater and defroster
Fresh air filter for HVAC
Tinted glass
Dome light with automatic dimming, door activated and push ON/OFF
Overhead storage console with nets, CB pocket, Pearl Gray interior
Deluxe cab interior trim
Molded plastic door trim panels
Molded plastic storage pocket; driver's and passenger's front cab doors
Padded cloth headliner
Black rubber floor covering
Vinyl sun visors
Cab suspension; air bag type
Single color cab exterior finish paint

Tires And Wheels:

Steel disc wheels; painted white; with 10-stud pattern; 8.25" x 22.5" DC rims; hub piloted

Tires Front: 12R22.5 Unisteel G287 MSA (Goodyear); load range H; 16 ply

Tires Rear: 12R22.5 Unisteel G177 (Goodyear); load range H; 16 ply

Included with chassis order, one (1) spare wheel and one (1) spare tire matching the wheels and rear tires, delivered affixed to the cab and chassis.

CHASSIS ELECTRICAL REQUIREMENTS

CHASSIS ELECTRICAL ADDITIONAL EQUIPMENT AND MODIFICATIONS

The apparatus chassis shall be equipped with a heavy-duty 12 volt direct current (VDC) negative ground electrical system. The electrical system shall include all parts, components, switches, relays, wiring, and other devices required to assure complete, consistent and proper operation of the completed apparatus.

All lights are required to comply with Federal Government Codes for vehicles of this size and design shall be provided and installed. These lights shall include headlamps and front turn signals with hazard switch, cab marker and clearance lights, back up lights, stop-turn-tail and license plate lights.

All switches for the warning lights and other electrical equipment shall be mounted on a separate switch panel located on the center console in the cab interior. The switches shall be functionally laid out, properly identified, and shall be located within easy reach of both the driver and the officer. The warning light system shall have a “master” switch, which shall allow for the pre-selection of all warning lights. All switches shall be of a heavy duty design.

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

BATTERY MASTER SWITCH

One (1) battery cutoff switch shall be provided in the cab. The switch shall be a Cole Hersee brand, Model #M-2484-16, with a Model #82065 switch plate “Off/On” label, or equivalent. The switch shall be rated for 175 amps continuous duty and 800 amps intermittent duty. The switch shall be located on the floorboard to the left side of the driver’s seat and placed as far aft as possible to protect accidental actuation.

BATTERY ON INDICATOR LIGHT

One (1) "Battery On" indicator light, with a green lens, shall be provided on the dashboard in the cab interior within view of the driver’s seating position. This light shall illuminate anytime the battery switch is turned to the "ON" position.

ECM PROGRAMMING

The cab and chassis ECM shall be programmed as required to allow the use of the OEM cruise control feature as a manually-controlled fast idle and as a backup to the pump operator’s panel throttle.

BACK UP ALARM

One (1) 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 dba while in operation.

MAP LIGHT

One (1) flexible goose neck, high-intensity map light shall be provided on 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.

GROUND LIGHTS

Four (4) 4” clear LED lights shall be provided under the chassis steps, ground-facing, two (2) on each side. Lights shall be wired to the cab door switch and a switch in the cab.

ANTENNAS

Four (4) antenna bases shall be supplied and mounted on the cab roof as specified. The antenna cables shall be routed to the cab interior, terminating at location of radio mounting bracket.

USFS INSTALLED RADIO PRE-WIRE

The chassis cab interior shall be wired with battery power, battery ground, switched power, and radio prebroadcast wires to the siren or PA, and labeled to simplify USFS radio installation.

TRAFFIC WARNING SYSTEMS

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

ELECTRONIC SIREN

One (1) Federal Signal brand, Model #PA300-MSC, or equivalent, electronic siren controller shall be provided and mounted in the cab center console in a location convenient to both the driver and the officer. The siren shall have four basic siren tones: manual, wail, yelp and hi-lo, as well as an electronic air horn, radio rebroadcast capability and a public address system.

The siren shall also feature the TAP II instant yelp function and shall be capable of 58, 100 or 200 watt operation. The siren shall have a hard wired noise canceling microphone for P.A. use, and shall be wired to the specified speaker.

SPEAKER

One (1) Code 3 brand, Model #Z100, or equivalent, 100 watt siren speaker shall be provided and mounted behind the driver's side of the front bumper. The speaker shall be wired to the specified electronic siren controller.

FORWARD UPPER ZONE A/B/D LIGHT BAR

One (1) Whelen brand, Freedom LED light bar, or equivalent, shall be provided and installed on the cab roof, facing forward. The light bar shall be 55" wide, and shall contain six (6) flashing LED modules, one (1) at each corner and two (2) forward-facing. The lightbar shall also contain two (2) forward-facing steady burning LED modules. The light bar shall have all red lenses.

The light bar shall be permanently mounted to the cab roof and wired to the "Lightbar" switch in the cab center console.

AFT UPPER ZONE B/D WARNING LIGHTS

Two (2) Whelen brand, 600 Series, or equivalent, red LED warning lights, with mounting flanges, shall be provided at the upper rear corners of the body, side-facing, one (1) on each side of the body. The lights shall be wired to the "Warn Lights" switch on the cab center console.

UPPER ZONE C WARNING LIGHTS

Two (2) Whelen brand, 600 Series, or equivalent, red LED warning lights, with mounting flanges, shall be provided at the upper rear of the body outboard of the beavertails, rear-facing, one (1) on each side of the body. The lights shall be wired to the "Warn Lights" switch on the cab center console.

One (1) Whelen brand, 900 series, or equivalent, amber LED warning light, with mounting flange, shall be provided at the upper rear driver's side outboard corner of the rear of the body, rear-facing. The light shall be wired to the "Rear Amber" switch on the cab center console.

LOWER ZONE A WARNING LIGHTS

Two (2) Whelen brand, 700 Series, or equivalent, red LED warning lights, with mounting flanges, shall be provided and mounted in the lower outboard corners of the cab grille, forward-facing, one (1) on each side. The lights shall be wired to the "Warn Lights" switch on the cab center console.

FORWARD LOWER ZONE B/D WARNING LIGHTS

Two (2) Whelen brand, 700 Series, or equivalent, red LED warning lights, with mounting flanges, shall be

provided and mounted on the sides of the chassis tilt hood, as low and as far forward as possible, side-facing, one (1) on each side. The lights shall be wired to the “Warn Lights” switch on the cab center console.

MID SHIP WARNING LIGHTS

Two (2) Whelen brand, 600 Series, or equivalent, red LED warning lights, with mounting flanges, shall be provided on the exterior body sides above the rear wheel well, one (1) on each side. The lights shall be wired to the “Warn Lights” switch on the cab center console.

AFT LOWER ZONE B/D WARNING LIGHTS

Two (2) Whelen brand, 600 Series, or equivalent, red LED warning lights, with mounting flanges, shall be provided at the rear sides of the body on the exterior of the beavertails, side-facing, one (1) on each side. The lights shall be wired to the “Warn Lights” switch on the cab center console.

LOWER ZONE C WARNING LIGHTS

Two (2) Whelen brand, 600 Series, or equivalent, LED warning lights shall be provided at the lower rear of the body in the bottom position of a common housing with the DOT lights, rear-facing, one (1) on each side. The lights shall be wired to the “Warn Lights” switch on the cab center console.

AIR HORN

One (1) Buell brand, Model #1063, or equivalent, 15" air horn shall be provided and mounted under the hood on the passenger’s side. One (1) foot switch shall be provided on the driver’s side cab floor, and one (1) momentary pushbutton switch shall be provided on the upper right corner of the officer’s side top surface of the cab center console.

HEADLIGHT FLASHER

One (1) Whelen brand, Model #UHF 2150A, or equivalent, solid state headlight flasher shall be installed and wired for daytime operation. The flasher shall be a multipurpose type with a high beam-activated cut out option. The flasher shall be wired to the “Wig Wag” switch on the cab center console, through the parking brake valve, so that it is disabled when the parking brake is applied.

CHASSIS ADDITIONS AND MODIFICATIONS

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

APPARATUS FLUID TYPES AND QUANTITIES

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.

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 Drive Axle Lubricant
Pump Gearbox Lubricant

SEATING CAPACITY

The completed apparatus shall be designed to have a fully enclosed seat with an approved seat belt for each occupant. The term "fully enclosed" shall mean four sides, a top and a bottom, with an appropriate door for easy entrance to and exit from the seating position.

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.

This apparatus shall have a seating capacity of five (5) personnel.

SEATING

Three (3) H.O. Bostrom brand seats, or equivalent, with high back backrests shall be provided and installed in the rear of the cab interior. These seats shall replace the OEM rear bench seat that may have been provided with the chassis. The replacement seats shall each have a 12" high riser, 11-degree tilt capability, with an under seat storage area. The center seat shall be provided with two (2) armrests and the outboard seats shall each be equipped with one (1) inboard armrest. Seat upholstery shall match OEM front seat upholstery.

SEAT BELTS

Three (3) point shoulder harness type seat belts shall be provided on all four (4) outboard seating positions. The center rear seating position shall have a two (2) point lap belt type seat belt.

All seatbelts shall be red in color.

SEAT BELT WARNING

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.

VEHICLE HEIGHT WARNING

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.

FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

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

NOISE HAZARD WARNING

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.

AIR FILTER EMBER PROTECTION SCREEN WARNING

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.

CAB CONSOLE

The cab shall be equipped with an operator's control console located between the front driver's and officer's air ride seats. This console shall be sized to accommodate customer-mounted radios. The console shall be fabricated from steel, and painted with a matte black finish.

The console shall contain the following controls and switches:

One (1) Span brand, or equivalent, 2-1/2" diameter backlit discharge pressure gauge, 0-600 PSI
One (1) Fire Research Corporation brand, Model #WL2500, or equivalent, mini display tank level gauge
One (1) Federal Signal brand, Model #PA300-MSC, or equivalent, electronic siren controller
One (1) flexible map light
Four (4) 12V power outlets

Three (3) switch panels, containing a total of fourteen (15) switches with pilot lights, numbered and function labeled, configured from left to right as follows:

1- EMERGENCY MASTER
2- LIGHT BAR
3- WARN LIGHTS
4- REAR AMBER
5- WIG WAG
6- HI/LO
7- HORN/SIREN
8- LEFT SCENE
9- REAR SCENE
10- RIGHT SCENE
11- MAP LIGHT
12- GROUND LIGHTS
13- DIRECT LEFT
14- CENTER OUT
15- DIRECT RIGHT

CENTER CONSOLE AFT STORAGE

A compartment for storage of items, such as maps and hand-held radios, shall be provided and attached directly behind the center console. The storage compartment shall be fabricated from steel and painted with a matte black finish. Configuration and size of the compartment shall be as-specified by the

procuring activity. The height and width shall not exceed the cab console, and the maximum depth shall be 18 inches. The storage compartment shall be configured so as to be easily removable for access to the console inspection panel.

CHASSIS MANUFACTURER GRAB HANDLE

One (1) exterior chassis manufacturer grab handle shall be provided and installed aft of rear door; on driver's side of cab; with rubber insert.

FRONT TOW HOOKS

Two (2) original equipment front tow hooks shall be supplied with the chassis from the chassis manufacturer.

TOW EYES

Two (2) heavy-duty tow eyes shall be provided at the rear of the apparatus, below the rear step. The tow eyes shall be mounted to the chassis frame.

FRONT BUMPER EXTENSION

A front bumper extension shall be provided at the forward end of the chassis framerails. The bumper extension shall be covered with aluminum diamondplate. Support bracing shall be provided as required. The ends of the aluminum diamondplate cover shall be radiused and ground smooth.

When completed, the overall length of the apparatus shall not exceed 300".

HOSE STORAGE TRAY

One (1) hose storage tray shall be provided in the center of the front bumper extension. The storage tray shall be approximately 20" L X 7" W X 12" D. The tray shall be provided with an expanded metal mesh floor to allow drainage and air circulation. An aluminum diamondplate cover shall be provided for the hosewell. The cover shall be approximately 1" shorter than the length of the hosewell to allow the front discharge hose to remain preconnected to the front bumper discharge swivel with the cover closed.

The hose storage tray shall be capable of holding fifty feet (50') of 1-1/2" hose.

FRONT FENDERS, RUBBER

An extruded black rubber fenderette shall be installed on each front wheel well opening on the chassis tilt hood.

MUD FLAPS

One (1) 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.

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.

CAB STEPS, BATTERIES AND AIR TANKS

All cab steps shall be modified in such a manner as to provide maximum ground clearance.

The chassis-mounted battery box shall be relocated in such a manner as to provide maximum ground clearance.

The chassis-mounted air tanks shall be relocated to the inside of the passenger's side rear cab steps, and shall be mounted in such a manner as to provide maximum ground clearance. The rear cab step covering the air tanks shall be adjusted aft, as far as practical, in order to cover the air tank connections.

EXHAUST SYSTEM

The exhaust system shall remain unmodified and as received from the chassis manufacturer. The exhaust system shall be mounted in a horizontal configuration under the passenger's side of the cab.

VERTICAL EXHAUST

A vertical exhaust pipe shall be mounted at the passenger's side rear corner of the cab. The vertical exhaust shall be sufficiently shielded or wrapped to prevent burn injuries to personnel who may come in contact with the exhaust pipe while entering or exiting the chassis rear passenger's side door. The maximum height of the exhaust shall be 110 inches from the ground to the top of the exhaust.

HEAT PROTECTION

The exhaust after-treatment system shall be sufficiently shielded or wrapped to protect the underside of the chassis cab during active regeneration. Heat from regeneration shall not be detected by personnel seated inside the cab.

AIR LINE, FUEL HOSE, ELECTRICAL HARNESS AND CONNECTOR PROTECTION

All air lines, fuel lines and electrical harnesses below the chassis frame rails shall be protected with a fire proof sleeve. All air lines and connectors to air tank located between chassis steps shall be protected with a fire proof sleeve. All protected and wrapped lines shall have continuous coverage, to include the line to tank connections.

CABIN AIR EMBER GUARD

The cabin air filter shall be protected by an ember guard with a maximum mesh opening of 0.039 inches.

TRANSMISSION PTO

A transmission power take-off (PTO) unit shall be provided and installed on the chassis automatic transmission to drive the firefighting water pump. The PTO shall be a 10-bolt type, with a minimum torque rating of 300 lb. ft. (intermediate duty), and an engine speed ratio that provides the required pump performance. The PTO driveshaft shall be equipped with 1410 series universal joints. The PTO shift shall be located in the cab interior in a location accessible to both the driver's and officer's seating positions.

APPARATUS BODY DESCRIPTION

BODY DESIGN

The body shall be designed for fire/rescue service operations only. Commercially designed bodies intended for use in other vocations or applications are unacceptable in quality, construction, design or durability. The body module shall utilize a full welded subframe, separate from the chassis, which shall be incorporated into the welded body superstructure.

BODY CONSTRUCTION

The body module shall be comprised of a structural framework of vertical and horizontal components fabricated from structural steel tubing. Formed sheet steel or sheet aluminum bodies, extruded aluminum bodies, or bodies that are of bolted or riveted construction shall not be acceptable. The framework shall define the perimeters of all body compartment door openings. All compartmentation shall be of an inset design, installed from the interior of the body and permanently attached to the structural framework by welding. All welding, metal work and fabrication shall be completed with the highest degree of quality and precision. The body subframe and superstructure shall be a completely welded unit, forming a unitized structure for strength and longevity. All fasteners utilized in the construction of the body module shall be stainless steel. Any threaded fasteners utilized shall be machine screw type, and all holes shall be properly sized and tapped to create threads to receive them. Threaded expanding inserts shall be utilized where required. All fasteners shall utilize a locking method to prevent loosening from vibration. Strict attention shall be given to the elimination of hazards to personnel and equipment, such as rough edges, sharp corners, or protruding nuts and bolts. All exposed welded corners on aluminum tread plate shall be polished to a bright finish. All exposed corners shall be radiused and deburred. Where fasteners may come into contact with personnel or equipment, acorn type nuts or countersunk fasteners shall be utilized. All structural seams shall be fully seam welded, with all other body seams being caulked prior to painting.

The body shall be completely modular in design, thereby allowing its transfer to a new chassis, without cutting or welding, in the event of an accident or chassis replacement.

BODY SUBFRAME

The body subframe shall be fabricated from 2" x 2", 2" x 3" and 3" x 3" structural steel tubing, .120" wall thickness, with 2" x 3" .250” wall thickness crossmembers. Gussets, fabricated from .250” steel plate, shall be provided at all points where the horizontal subframe crossmembers are welded to the body module vertical superstructure.

The subframe shall be isolated from the chassis framerails by sections of .50” x 6” steel flatbar which have had a .50” x 6” rubber pad permanently vulcanized to them. The flatbar shall be welded to the bottom of the subframe, doubling as an additional gusset at the adjacent subframe crossmember joints. This design shall prevent the shifting or displacement of the isolator pads.

BODY MATERIALS

All materials utilized in the fabrication of the body shall be of the correct type, alloy, and thickness to withstand the intended usage and provide protection against cracking, corrosion or metal fatigue. All materials utilized shall be of open stock origin, available to all apparatus manufacturers and commonly available through local sources, for the rapid and economical repair or modification of the body. Any use of proprietary parts or materials in the construction of the body shall be unacceptable, due to the potential for delays or difficulties in the event future repairs or service become necessary.

The body superstructure shall be fabricated from 2" x 1", 2" x 2", 2" x 3" and 2" x 4" structural steel tubing, .120" wall thickness.

BODY MOUNTING

The body module shall be connected to the chassis framerails with two (2) different designs of mounts.

The mounts at the aft end of the body shall be comprised of vertical .625” thick steel plates that are welded to the body subframe and bolted to the exterior vertical surface of the chassis framerails. These mounts shall extend rearward horizontally to incorporate the rear step supports and rear tow eyes.

Two (2) mounts of this design shall be provided, one (1) on each side of the body.

The mounts at the forward end of the body shall be comprised of a two-piece design, fabricated from .250” steel plate, with the upper section welded to the body module subframe and the lower section bolted to the exterior vertical surface of the chassis framerails. The upper mount section shall be designed to nest within the lower mount section. The body mount sections shall be aligned and connected by a .625” diameter Grade 8 bolt, equipped with an appropriate tension rating spring, flat washers and a locking nut.

Two (2) mounts of this design shall be provided, one (1) on each side of the body.

DRIP MOLDINGS

Bright anodized extruded aluminum drip moldings shall be installed above all compartment door openings.

VERTICAL SURFACES

The vertical surfaces at the front and outboard rear of the body shall be covered with polished aluminum tread plate for appearance, wear, and enhanced visibility at night.

GRAB HANDLE

One (1) Austin brand, slip-resistant extruded grab handle with rubber inserts, or equivalent, with a minimum length of 36” shall be provided and located on the rear-facing surface of the passenger’s side beavertail at the rear of the body, mounted vertically.

REAR STEP

A full-width step shall be provided at the rear of the body for hose loading and unloading operations. The step shall be mounted 2" above the rear edge of the body, and shall incorporate a rear body support and tow eyes in accordance with U.S. Forest Service specifications. The step shall be fabricated from .187" steel plate, with double breaks along the side and rear facing edges. The rear step shall have a depth of 12", and shall be finish painted with black Dura-Coat on the walking surface.

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

HOSE BED ACCESS LADDER

A hosebed access ladder, fabricated of aluminum tubing with aluminum non-slip rungs, shall be installed at the rear of the apparatus body on the driver’s side. The ladder shall be secured to the rear step and to the upper rear surface of the body. The height of the ladder rails shall extend beyond the top of the body to facilitate access to the hosebed storage area. The ladder shall be finished in black Dura-Coat prior to installation. Drain holes shall be provided at the base of each vertical leg for drainage. A pull-out, drop-down step shall be provided under the rear step, located directly below the access ladder.

COMPARTMENTATION

All compartment walls and ceilings shall be fabricated from 14 gauge galvanneal steel. All compartment floors shall be fabricated from 12 gauge galvanneal steel. All compartments shall be welded for strength and shall be sealed from the elements.

All compartments shall be attached to the steel tubing superstructure only, in order to maintain a truly modular design.

All compartments shall be individual and free standing. No compartment shall share a common wall, floor or ceiling, unless so designed to be transverse with an adjacent compartment. Fasteners from the exterior of the apparatus body or adjacent compartments shall not penetrate any compartment walls or ceilings.

All compartment interiors shall be free of exposed electrical harnesses or plumbing components.

All enclosed compartments shall be water and dust tight.

All compartments shall be as large as possible, as determined by the design of the apparatus.

The approximate compartment sizes required are listed below:

DRIVER'S SIDE COMPARTMENTS

One (1) rescue style compartment shall be provided on the driver's side of the apparatus body forward of the rear wheels. The compartment shall extend from the front of the body to the front of the wheel well area in width and equal to the compartment over the rear wheel at the top extending to the hose storage compartment below it in height.

Approximate Compartment Size: 37"W X 43"H X 14"D

One (1) hose storage compartment shall be provided on the driver's side of the apparatus under the rescue style compartment forward of the rear wheels. A drop down aluminum diamondplate access door shall be provided.

Approximate Compartment Size: 37"W X 6"H X 19"D

One (1) Foam Pro system mounting compartment, with hinged floor to drop down for service, shall be provided on the driver's side of the apparatus under the hose storage compartment. A drop down aluminum diamondplate access door shall be provided.

Approximate Compartment Size: 37"W X 10"H X 19"D

One (1) low side compartment shall be provided on the driver's side of the apparatus body behind the rear wheels. The compartment shall extend from behind the wheel well area to the front of the rear step area in width and from the top of the fender area over the rear wheels to the bottom of the body in height.

Approximate Compartment Size: 19.5"W X 24"H X 14"D

Two (2) compartments shall be provided that shall span across the entire width of the wheel well and lower compartment behind the rear wheels on the driver's side. The rear wall shall extend back but shall not be common with the water tank. The rear wall of the compartment shall be designed so that holes can be drilled to mount equipment without damaging the water tank.

Approximate Compartment Size:	forward compartment	38"W X 33”H X 14"D
	aft compartment	38”W (front)/34.5”W (rear) X 33”H X 25” D

PASSENGER'S SIDE COMPARTMENTS

One (1) rescue style compartment shall be provided on the passenger's side of the apparatus body forward of the rear wheels. The compartment shall extend from the front of the body to the front of the wheel well area in width and equal to the compartment over the rear wheel at the top extending to the hose storage compartment below it in height.

Approximate Compartment Size: 37"W X 54.5"H X 14"D (upper section)/24.5”D (lower section)

One (1) hose storage compartment shall be provided on the passenger's side of the apparatus under the rescue style compartment forward of the rear wheels. A drop down aluminum diamondplate access door shall be provided.

Approximate Compartment Size: 37"W X 6"H X 24"D

One (1) low side compartment shall be provided on the passenger's side of the apparatus body behind the rear wheels. The compartment shall extend from behind the wheel well area to the front of the rear tail board area in width and from the top of the fender area over the rear wheels to the bottom of the body in height.

This compartment shall contain two (2) louvered vents. Moisture barriers shall be provided on the exterior of the compartment behind the vents. These barriers shall prevent water infiltration into the compartment and shall allow for the ventilation of the compartment interior.

Approximate Compartment Size: 19.5"W X 24"H X 14"D

Two (2) compartments shall be provided that shall span across the entire width of the wheel well and lower compartment behind the rear wheels on the passenger's side. The rear wall shall extend back but shall not be common with the water tank. The rear wall of the compartment shall be designed so that holes can be drilled to mount equipment without damaging the water tank.

Approximate Compartment Size:	forward compartment	38"W X 33”H X 14"D
	aft compartment	38”W (front)/34.5”W (rear) X 33”H X 25” D

HOSE REEL COMPARTMENT

One (1) compartment shall be provided at the center rear of the apparatus body. The compartment shall be provided with a hose connection and a quick-disconnect electrical connection to allow for the servicing or removal of the hose reel located in the compartment. A ROM brand, mill finish aluminum roll-up door, with a locking lift bar handle, shall be provided on this compartment.

Approximate Compartment Size: 40"W x 30"H x 27"D

DUNNAGE COMPARTMENTS

Two (2) compartments, accessible from the top of the body, shall be provided at the top of the apparatus at the upper outboard sides of the body, one (1) each side of the body.

The top of each compartment shall be enclosed with two (2) double pan lift up doors, hinged on their outboard edges, with a single gas strut and two (2) compression latches. One (1) compression latch on each door shall have a lock that is keyed to a number "1250" key. The compartment interiors shall be finished in Zolatone #20-11 (Apollo Gray), with the inner door pans finished in the apparatus body exterior color and the exterior top surfaces coated with black Dura Coat.

Approximate Compartment Sizes: 56"L x 11"W x 14"D

COMPARTMENT DOORS - ALUMINUM OVERLAP TYPE

All compartment doors shall be recessed into the apparatus body sides, with overlapping outer door panels for a secondary seal. Their construction shall be full double pan, with a 2" inner pan. No welds shall be visible on the outer door panel, door pan sides or inner door panel. The door edges shall be contoured, with radiused corners, to provide a smooth, snag-free perimeter.

All painted compartment doors shall be constructed with an inner and outer door pan of .125” bright finish aluminum plate, attached to a square aluminum tubing inner structure. The inner door structure shall be fabricated from 1.75” X 1.75" X .140" wall thickness square aluminum tubing, welded into a framework with perimeter dimensions matching the dimensions of the inner door panel. Industrial grade closed cell foam of the correct thickness shall be inserted between the inner and outer door pans within the tubing framework. The outer door panel shall be attached to the framework with industrial grade double-sided tape and stitch welding. The inner door panel shall be attached with industrial grade double-sided tape.

No welding shall be visible on the finished door.

A removable stainless steel cover shall be installed on the inner door panel for access to the latch mechanism for servicing or replacement.

All compartment door opening perimeters shall be fitted with automotive grade, closed-cell, extruded, wire-reinforced, clip-on type door seals. All door outer panels shall have automotive-grade, closed-cell, self-adhesive, "D" type gaskets fitted to the overlap surface for a secondary seal.

DOOR LATCHES AND HARDWARE

All compartment door latch assemblies shall be installed with threaded fasteners, shall not be welded, and shall be easily removable through the outer panel of the door for servicing or replacement. All door latch assemblies shall be of a flush-mount, rotary "D-Handle" design, with all external components fabricated from polished stainless steel. All latches shall be of a slam-type design, with a two-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.

The following door latch assemblies shall be provided:

Compartment Door Handle Assembly - Hansen brand, Model # 279L SS, or equivalent

Compartment Door Latch Assembly - Hansen brand, Model # 550, or equivalent

Striker Bolt Assembly - Hansen brand, Model # 551S, or equivalent

All doors shall be mounted with continuous, heavy-duty stainless steel piano-type hinges. The hinges shall have pins with a minimum diameter of .250", and shall be polished to a mirror finish. The mounting holes in the hinges shall be pre-punched in a uniform and standard manner to allow easy replacement in the future if damaged. The mounting holes shall be slotted to allow the adjustment of the door within the compartment door opening. The slots that are punched into the hinge shall be length wise on one leaf and width wise on the opposite leaf to allow the doors to be adjusted up and down as well as in and out relative to the opening to maintain a good seal and ease of opening. All hinges shall be attached to the doors and the apparatus body with 1/4"-20 stainless steel truss head screws. The use of nuts and bolts, sheet metal screws, rivets, welding or any other means of hinge attachment that does not allow for easy readjustment in the field shall be unacceptable.

DOOR HOLD OPEN DEVICES

All vertically-hinged, outward-opening compartment doors shall be provided with one (1) gas cylinder type

hold open device, properly sized for the door, and installed horizontally at the top of the compartment door opening. The hold open device shall assist the compartment door while opening and closing, and shall be securely fastened to the compartment door inner pan and compartment ceiling with threaded fasteners, enabling it to be easily removed for repair or replacement. 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.
All horizontally-hinged, overhead lift-up compartment doors shall be provided with two (2) extending, gas cylinder type hold open devices, one (1) mounted vertically on each side of the compartment door opening. The pressure rating of the gas cylinders shall be carefully matched to the size and weight of the compartment door, and they shall hold the compartment door securely open at 90 degrees to the apparatus body, or more when required, without any additional support. The gas cylinder hold openers shall dampen the upward movement of the compartment door while opening, and shall permit the closing of the compartment door without the need to release any type of manual locking devices.

The gas cylinders shall be securely fastened to the compartment door inner panels and compartment side walls with threaded fasteners and shall be easily removable for repair or replacement. All horizontally-hinged, overhead lift-up compartment doors shall be capable of being closed with one hand, allowing a free hand to hold equipment or supplies.

The doors on the apparatus body shall be provided as follows:

Single, vertically hinged painted swing open doors shall be provided on the following compartments:

Both compartments forward and aft of the rear wheels, two (2) each side of the body.

Single, horizontally hinged painted lift up doors shall be provided on the following compartments:

Both compartments above the rear wheel well quarter panel areas and lower rear compartment compartments, two (2) each side of the body.

The doors listed above shall include locking exterior latches.

Single, horizontally hinged aluminum diamondplate drop down doors shall be provided on the following compartments:

Both hose storage compartments under the compartments forward of the rear wheel well quarter panel areas, one (1) each side of the body.

The foam system compartment at the forward corner of the driver's side of the body.

REAR COMPARTMENT ROLL UP DOOR

A roll-up door shall be provided and installed on the hose reel compartment at the center rear of the body. The door shall be designed to open completely out of the way and shall use a roll configuration mounted at the rear of the compartment to minimize its intrusion into the compartment space.

The roll up door shall be fabricated from double wall anodized aluminum slats. Nylon end shoes, sliding in the door side tracks, shall be provided on each slat to assure smooth operation and avoid the requirement for lubrication.

Each slat shall be designed with an interseal to prevent water from entering the compartment, and to assist with absorbing shock and eliminating clatter.

The roll up doors shall be designed to work over an extreme temperature range. The latch shall be a lift bar, with lock, to allow one hand opening.

COMPARTMENT FLOOR MATS

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.

ADJUSTABLE SHELF CHANNELS

A minimum of four (4) vertically-mounted aluminum Unistrut channels shall be provided and installed in all enclosed body compartments for the current or future installation of infinitely-adjustable shelving, slide out trays or equipment brackets. The channels shall so designed as to allow the use of spring-loaded, self-tightening extrusion nuts inside the channels to install the specified shelving.

TOOL BRACKET MOUNTING CHANNELS

Two (2) parallel vertically-mounted Unistrut channels shall be mounted on the rear wall of the compartments listed below. These channels shall be located in the compartment in a configuration to allow the customer mounting of tool brackets. The channels shall so designed as to allow the use of spring-loaded, self-tightening extrusion nuts inside the channels to install the specified tool brackets.

One pair of channels shall be located in the compartment ahead of the rear wheels on the passenger's side of the body.

COMPARTMENT SHELVES

Eleven (11) adjustable shelves shall be provided and installed in the completed body compartments. The shelves shall be fabricated from .125" bright finish smooth aluminum plate, with a 90 degree break on the inboard and outboard sides, 1" in height. A 1” x 1” aluminum angle shall be provided on both ends of the shelf to enclose the ends and attach the shelf to the mounting channels. The shelves shall be free of welds, sharp corners or rough edges. The shelves shall be attached to the Unistrut channels fastened to the compartment side walls and shall be infinitely adjustable. Spring-loaded extrusion nuts and locking fasteners shall be provided.

The shelf locations shall be as follows:

Three (3) in the driver’s side compartment forward of the rear wheels

Two (2) in each of the driver's side compartments above the rear wheels

Two (2) in each of the passenger's side compartments above the rear wheels

I-ZONE BRACKETS

Two (2) folding I-Zone hose brackets shall be provided on the rear of the apparatus body, rear-facing, one (1) on each side of the body. The brackets shall be located on the exterior surfaces of the beavertails. Each I-Zone bracket assembly shall consist of an aluminum diamond plate mount and a tubular aluminum fold down bracket. The pivot point of the bracket shall be located in the aluminum diamond plate mount. The bracket shall be held in a vertical position when not in use. A nylon insulated clip shall be provided to secure the bracket when stowed in the vertical position. A protective cap shall be provided on the outboard end of the fold down bracket.

FENDERS AND WHEEL WELLS

The rear wheel wells of the apparatus body shall be provided with fenders and full liners. The rear fenders shall be fabricated from extruded black rubber, contoured to match the perimeter of the wheel

well openings. The rear fenders shall extend out from the body approximately 2" and shall have a 3" radius. The fenders shall be bolted to the wheel well liner and/or the body to allow for easy replacement in the event of damage. Full-width wheel well liners shall be provided to deflect road splash away from the apparatus body module interior. The wheel well liners shall be contoured to match the shape of the fenders. The wheel well liners shall be sized to provide ample clearance for chains fitted to the specified size of wheel and tire fitted to the chassis and shall be bolted to the quarter panel and the fender to allow for easy replacement in the event of damage. The vertical body quarter panels spanning between the rear wheel wells and the apparatus body superstructure shall be fabricated from 12 gauge galvanneal steel, continuously seam welded to the body superstructure and body worked as needed to provide a smooth seamless appearance. The quarter panels shall be finish painted to match the body.

WHEEL CHOCK STORAGE COMPARTMENTS

Two (2) wheel chock storage compartments, each with a bright aluminum locking door, shall be provided in the wheel well areas, one (1) each side of the apparatus body, aft of the rear wheel well openings.

BODY SCUFF GUARDS

Scuff guards shall be provided and installed on the bottom horizontal edges of the body, under all compartment door openings, both forward and aft of the rear wheel well openings. The scuff guards shall be fabricated from .063" polished aluminum tread plate.

HOSE BED

The hose bed shall be located above the water tank and shall extend from the front to the rear of the apparatus body. The front bulkhead of the hose bed, as well as the side sheets, shall be fabricated from .125" smooth aluminum plate, with a bright finish on the unpainted exposed sides. The inside walls of the hose bed shall not be painted and shall be left in a natural aluminum finish. The side sheets shall not be an integral part of the body that requires welding to secure them. The complete hose bed interior shall be free of any projections to eliminate the possibility of damage to the stored hoses.

The hose bed shall have a removable extruded aluminum slat floor. The extrusions shall incorporate a ribbed design and shall be 3" wide x .750" thick.

The horizontal rear hose bed exit area shall be protected with a stainless steel angle trim piece spanning the full width of the hose bed.

HOSE BED DIVIDERS

Three (3) hose bed dividers shall be provided and mounted in the hose bed. The dividers shall be fabricated from .250" smooth aluminum plate, with an extruded aluminum base for strength. The dividers shall be completely adjustable, excluding the fill tower areas, through the use of extruded aluminum Unistrut type channels at the front and the rear of the hose bed.

HOSE BED COVER

The hose bed shall have a two-piece aluminum diamond plate cover. The two-piece cover shall be fabricated from .188" bright finish aluminum diamond plate, reinforced as required to be sturdy enough to support the weight of two personnel standing on the cover, however, the lifting force to open either cover section shall not exceed 60 lbs. The cover shall be mounted with full-length polished stainless steel hinges on the outboard edges of the hose bed. Each cover section shall be angled up from the outer edge of the hosebed to increase the hose bed storage area and to provide drainage. The covers, when closed, shall rest in a fixed channel "trough" mounted on a .250" thick aluminum plate support running the length of the hose bed. A downwards flange, approximately 2" wide and spanning the length of each cover section, shall be formed at 90 degrees to the cover, along the inboard edges. The flange of each cover shall rest in the trough when the lids are closed.

Each cover section shall be equipped with a heavy duty gas strut mounted at its outboard front corner to assist with opening the cover section. Two (2) heavy duty cam lock style latches shall be mounted on the top surface of the covers, one (1) at the front and one (1) at the rear, to secure the covers during transport.

Each cover section shall have one (1) 4” diameter light mounted to its underside to illuminate the hose bed area interior. The hose bed lights shall be switched at the pump operator’s panel.

A total of four (4) 1-1/4" diameter handrails, with rubber inserts, shall be provided on the cover section exterior surfaces to facilitate access to the top of the truck and to assist in opening and closing the cover sections. Each handrail shall be secured with two chrome plated end stanchions.
The handrails shall be provided as follows:

Two (2) handrails, each approximately 18" long, shall be mounted running front to rear on the top rear of the driver's side cover section, directly ahead of each access ladder side rail.

Two (2) 24" handrails, one (1) on each cover section, shall be installed on the top surface at the opening edge, running front to rear, starting approximately 18" from the rear edge of the cover.

A black fabric flap, fabricated from Herculite 80 material, shall be provided at the rear of each cover section, equipped with three (3) adjustable straps, spring-loaded metal buckles and related tie down hardware for each flap. The Herculite 80 material shall be flame retardant, resistant to mildew, abrasion, tearing and ultraviolet sun rays.

Four (4) rope tie down brackets shall be installed toward the hinged side of each cover section, evenly spaced from front to rear.

The walking surfaces of the two-piece hose bed cover shall be coated with black Dura-Coat non-skid material.

STAINLESS STEEL BODY TRIM

All enclosed compartment door thresholds shall be covered with horizontal polished stainless steel scuff guards to provide paint protection against chips and scratches.

All vertical exterior body corners shall be covered with polished stainless steel angles, secured with fasteners, to act as body corner scuff guards and to provide paint protection against chips and scratches.

The horizontal rear hose bed exit threshold shall be covered with a polished stainless steel angle.

HARD SUCTION HOSE STORAGE

Two (2) hard suction hose storage compartments shall be provided in the hose bed area, one (1) on each side of the body. The compartments shall accommodate suction hose 10 ft. in length. The compartments shall be constructed from .125” smooth aluminum sheet and shall be fully enclosed within the apparatus body. The compartments shall be provided with horizontally-hinged lift up access doors, each with a paddle latch, at the rear of the body. The compartments shall be left in a natural aluminum finish, unpainted, with the top surfaces coated with black Dura-Coat non-skid material.

REAR CAB STEP STORAGE

Two (2) aluminum storage compartments, mounted in rear cab step, shall be provided, one each side of apparatus. Storage compartment door shall be diamond plate, with vertical hinge and compression latch. The door shall have approximate dimensions of 21”W X 8”H.

PUMP AND PLUMBING

PUMP GENERAL - MIDSHIP PUMP

The midship fire pump shall be a Hale Model CBP, 250 GPM single-stage P.T.O. driven, mounted behind the chassis cab. The pump shall be of a centrifugal design, with a cast iron pump body, bronze fitted, with a 3" suction inlet and a 2" discharge outlet. The pump shall be equipped with a pump gear case water cooler. The pump discharge shall be equipped with a full flow check valve.

PUMP SPECIFICATIONS

The pump shall be capable of delivering 200 GPM at 300 PSI output pressure from a 5 ft. lift through 24 ft. of 3” suction hose with strainer and also from apparatus water tank when installed on the apparatus.

The pump manufacturer shall certify that the pump can deliver the following capacities at net pump pressure from draft under the conditions listed after capacities;

Capacities:

300 GPM @ 150 PSI net pump pressure
200 GPM @ 300 PSI net pump pressure
100 GPM @ 400 PSI net pump pressure

Under the following conditions:

(1) An altitude of not more than 2000 ft. above sea level
(2) Atmospheric pressure of 29.9 in Hg (101 kPa)(corrected to sea level)
(3) Water temperature of 60°F (15.6°C)
(4) Through a single intake with 20 ft. of 3” suction hose equipped with a suction hose strainer
(5) With a lift of 10 ft.

When dry, the pump shall be capable of taking suction and discharging water with a lift of 10 feet or more in not more than 30 seconds.

PUMP BODY

The volute shall be fabricated from a fine grain alloy cast iron, with a minimum tensile strength of 30,000 pounds per square inch.

The entire pump shall be hydro dynamically tested to 400 PSI.

IMPELLERS

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

The impeller shall be keyed to the pump shaft and locked in place with a stainless steel lock nut.

Water sealing shall be accomplished by a spring loaded, carbon ring on a ceramic faced, brass seat mechanical seal, which shall automatically adjust for wear.

PUMP SHAFT

The pump shaft shall be rigidly supported by two deep groove ball bearings for minimum deflection.

The pump shaft shall be fabricated from heat-treated, electric furnace, corrosion resistant, stainless steel. The pump shaft and drive shaft shall be sealed with double lip oil seals to retain lubricants and to keep road dirt and water out of the drive unit.

The pump shaft shall be supported by a high lead bronze sleeve bearing on the impeller end to minimize shaft deflection.

DRIVE UNIT CONSTRUCTION

The drive unit, as well as the entire pump, shall be completely manufactured at the pump manufacturer's factory.

The drive unit bearings shall be of a heavy duty design and shall be precision ground to size.

The drive unit shall be of sufficient size to withstand full torque during pumping operations. The drive unit shall have ample capacity for lubricant reserve and the maintenance of proper operating temperatures.

All gears shall be fabricated from the highest quality steel alloy. They shall have case hardened teeth, to provide long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design shall be utilized to eliminate all possible end thrust.

The pump ratio shall be selected by the apparatus manufacturer to provide maximum performance within the limits of the engine, transmission and PTO selected. The pump shall provide 400 PSI static at between 1900 and 2100 RPM.

The pump driveline from the PTO to the pump shall be installed within the PTO, driveline, and transmission manufacturer’s recommendations and limits. The PTO output shaft and the pump input shaft shall be parallel, and the driveline u-joints shall be phased to minimize vibration. The apparatus manufacturer shall submit a driveline design showing u-joints, u-joint angles, u-joint sizes, u-joint torque ratings, and the driveline phasing plan and calculations to the Government for approval prior to installation of pump driveline.

PTO SHIFT

The pump shall be driven through a power take off (PTO) mounted on the chassis transmission. The PTO shall be equipped with a two-position, positive locking, electric over hydraulic shift control, located in the cab interior within reach of the driver’s seating position. The PTO shifting mechanism shall be interlocked with the parking brake and the chassis transmission to provide throttle control per NFPA requirements.

PUMP SHIFT INDICATOR LIGHTS

Two (2) indicator lights shall be provided in the cab interior. The indicator lights shall be illuminated when the pump drive has been engaged and shall be labeled "PUMP ENGAGED" and "OK TO PUMP,” per NFPA 1906. An additional light shall be provided, labeled "OK TO PUMP AND ROLL.”

REAR MOUNTED PUMP OPERATOR'S PANEL

The pump operator’s control panel shall be located at the rear of the apparatus body. The pump panel shall be fully removable and shall be fabricated from .125" clear anodized aluminum plate.

All controls and gauges shall be located at the rear of the apparatus body on either side of the hose reel compartment and shall be properly labeled. The right side panel shall be hinged for ease of access to its reverse side.

PUMP/PLUMBING COMPARTMENT

The floor of the rear hose reel compartment shall be removable to provide access to the pump plumbing.

All plumbing components shall be fabricated from stainless steel.

All pump compartment components, including wiring, gauges, pump panel rear surfaces, high pressure hoses, and small diameter tubing, shall be left unpainted for rapid identification and ease of repair.

PUMP PANEL LIGHTS

Two (2) non-glare incandescent lights, each installed on a cast aluminum mount, shall be provided to illuminate the rear mounted pump operator's panel. One (1) light shall be provided on each side of the rear compartment door. The lights shall be Weldon brand, Model #3-2025-7100, or equivalent, each with a single replaceable bulb and a clear refracted lens cover.

An additional light shall be located on the lower panel, under the rear compartment door, to illuminate the air control switches and other components on the lower control panel. The pump panel lights shall be controlled by a master switch on the pump operator's panel.

VALVES, CONTROLS, GAUGES & PLUMBING REQUIREMENTS

The following pump, plumbing, controls, gauges, and accessories shall be provided as indicated below. The plumbing requirements outlined below shall be considered a minimum standard, and shall be followed by the apparatus manufacturer without exception:

MAIN PUMP DISCHARGE AND INTAKE PLUMBING

The discharge and intake valves specified shall be either of a direct-actuated quarter turn design or shall be provided with control rods that are directly connected from the valve handle to the rear mounted pump panel. The valves or valve controls shall be provided with a locking feature

All discharges shall have NST thread brass bleed-off caps and chains, unless designed to be preconnected, or otherwise specified.

All valves shall be Akron 8800 series swing-out style. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments.

All valves and controls shall be easily accessible for service, repair or replacement.

Where vibration or chassis flexing may damage or loosen piping, the piping shall be equipped with victaulic couplings.

The main suction and discharge plumbing shall be welded stainless steel pipe or high pressure flexible hose. The flexible hose shall be designed to withstand the normal operating pressures of the pump. All high pressure hose shall be installed with a swivel or victaulic coupling on at least one end of the hose. The nominal sizes of the plumbing supplying the pump and discharges shall be as follows:

Main suction- 3 inch
Discharges – 1-1/2 inch, 2-1/2 inch
Hose reel - 1 inch

PUMP OPERATOR'S PANEL CONTROLS

The following components shall be provided on, and/or controlled at the rear mounted pump operator's panel:

PUMP PERFORMANCE ACCEPTANCE TEST PLATE

An identification plate shall be provided on the pump operator's panel to indicate the performance ratings of the pump. The plate shall provide performance information, including engine RPM, at the following flows and pressures from a 5 ft. lift through 24 ft. of 3" suction hose with a strainer:

250 GPM at 150 PSI
200 GPM at 300 PSI
150 GPM at 400 PSI

PUMP OPERATING INSTRUCTION PLATE

An identification plate shall be provided on the pump operator's panel with operating instructions.

TEST GAUGE CONNECTIONS

The plumbing system shall be provided with two (2) test ports on the pump panel exterior; one (1) plumbed to the intake side and one (1) plumbed to the discharge side of the water pump. These test ports shall be installed to provide a means for connecting certified test gauges when testing the pump's

performance. The test ports shall be located for easy access and shall be labeled.

SWITCH PANEL

One (1) switch panel, containing a total of six (6) switches with pilot lights, numbered and function labeled, configured from left to right as follows:

1- PANEL LIGHTS
2- COMPT LIGHTS
3- HOSEBED LIGHT
4- LEFT SCENE
5- REAR SCENE
6- RIGHT SCENE

PUMP PANEL LABELING

All controls, discharges, intakes, pressure gauges, and other pump panel components that are not provided with a pre-printed legend or trim plate shall be labeled as required for ease of operation. This labeling shall be accomplished through the use of color-coded identification tags. The tags shall be self adhesive, and shall be installed on the pump control panel with chrome plated bezels. The tags shall be placed adjacent to the components in such a way as to clearly distinguish the item that they are identifying.

MASTER DISCHARGE PRESSURE GAUGE

One (1) master discharge pressure gauge shall be provided on the operator's panel, located close to, above and to the left of, the master intake pressure gauge. The gauge shall be a Span brand, or equivalent, graduated from 0-600 PSI, with a minimum diameter of 4-1/2", back lit for nighttime operations and silicone liquid filled to prevent condensation inside the gauge and to dampen the movement. The pressure gauge shall be connected prior to any check valves on the pump discharge.

MASTER INTAKE PRESSURE GAUGE

One (1) master intake pressure gauge shall be provided on the operator's panel, located close to, below and to the right of, the master discharge pressure gauge. The gauge shall be a Span brand, or equivalent, 30-0-150 PSI graduated, with a minimum diameter of 4-1/2", back lit for nighttime operations and silicone liquid filled to prevent condensation inside the gauge and to dampen the movement.

PUMP COOLER/BY-PASS

A pump cooler/by-pass line, labeled #17 Pump Bypass, shall be plumbed from the discharge side of the pump to the water tank fill tower to cool the pump when it is engaged and water is not being discharged. This line shall be connected downstream of the pump discharge full flow check valve, and shall be plumbed through a **quarter-turn** panel-mounted ball valve. The valve shall be labeled “open” and “closed” and a warning label shall be affixed near the valve that states “pump damage can occur if valve is closed.” The valve handle position shall be vertical when open and horizontal when closed. Water flow shall be between 1.5 and 2.5 GPM at 150 PSI pump pressure. A larger diameter line may be used with an orifice at the fill tower, provided the orifice can be removed for cleaning.

MASTER DRAIN

One (1) air-actuated multiple-port drain valve shall be provided and controlled at the pump operator’s control panel. The valve shall be operated by a heavy duty toggle valve, equipped with an aircraft-style red protective cover to prevent accidental movement of the switch. The valve shall be plumbed to drain both the discharge and intake sides of the pump, the relief valve and other plumbing components as required. The valve shall be placed as low as possible to provide proper drainage of the components plumbed to it. The valve shall be rated to 600 PSI minimum and suitable for daily valve actuation. The

air supply from the chassis to the toggle valve shall be equipped with a check valve so that the multiple-port drain valve remains closed if the chassis air supply is depleted. The air supply to the toggle valve shall be downstream of the air pressure protection valve.

GAUGE DRAIN

Gauge drains shall be provided for the intake and discharge pressure gauges and shall be located behind the pump panel.

IN-CAB GAUGE

One (1) Span brand, or equivalent, pressure gauge shall be provided on the cab center console, within view of the driver's seating position, to monitor the pump's discharge pressure. The gauge shall be silicone liquid filled, with a minimum diameter of 2-1/2", graduated 0-600 PSI, and back lit for nighttime operations.

ENGINE STATUS CENTER

One (1) Class 1 brand, Model ESC engine status center shall be provided on the pump operator's panel to provide chassis engine monitoring and critical warnings. The ESC shall be a weatherproof display with super-bright digits.

The ESC shall continuously display chassis engine RPM, oil pressure, engine coolant temperature, and electrical system voltage, along with providing critical warnings. The warning levels for low oil pressure, high engine coolant temperature, low voltage (programmed for 11.8 VDC- default setting), and high voltage shall be independently programmable. The ESC shall provide visual warnings and an output for controlling an audible warning when alarm levels are reached. The ESC shall also provide a message center that displays total PTO hours.

REMOTE THROTTLE CONTROL

One (1) FRC brand, Model Infinity S, or equivalent, vernier style remote throttle control shall be provided on the pump operator's panel to control the chassis engine speed during pumping operations. The design of the remote throttle shall allow the throttle to start at idle when it is enabled, regardless of the vernier dial position. The remote throttle shall feature solid state optical technology, which shall eliminate potentiometers or electro-mechanical switches. The throttle shall sense the speed of the vernier dial for fast and fine RPM setting, and the central red idle button shall immediately return the chassis engine speed to idle. Regardless of chassis engine emissions status, the throttle control shall remain operational.

AUTOMATIC PUMP OVERRIDE

A pump override system shall be provided to automatically return the chassis engine to idle if the pump discharge pressure drops below 50 PSI.

A toggle switch, properly labeled, shall be located on the pump operator's panel to allow the operator to disengage the automatic shutdown feature when required.

WATER TANK LEVEL SIGHT GAUGE

One (1) sight tube level gauge shall be provided on the pump operator's panel to monitor the water tank liquid level. This level gauge shall be fabricated from clear acrylic tubing, with stainless steel rods down each side for protection of the sight tube. A chromed shut off valve, with a built in drain, shall be provided at the bottom of the gauge to drain water from the tube in cold weather. A vent line shall be installed at the top of the sight tube and routed to the water tank fill tower to exhaust trapped air to the atmosphere.

WATER TANK LEVEL ELECTRONIC GAUGES

One (1) Fire Research brand, Model WL2000, or equivalent, tank level gauge shall be provided on the pump operator's panel to monitor the water tank liquid level. The gauge shall indicate the water tank liquid level on an LED bar graph display.

One (1) Fire Research brand, Model WL2500, or equivalent, mini tank level gauge shall be provided on the cab center console, within view of the driver's seating position, to monitor the water tank liquid level. The gauge shall indicate the water tank liquid level on an LED bar graph display, and shall be wired in common with the sensor circuit for the pump operator's panel-mounted gauge.

CLASS A FOAM TANK LEVEL GAUGE

One (1) Fire Research brand, Model WL 2600, or equivalent, tank level gauge shall be provided on the pump operator's panel to monitor the foam concentrate storage tank level. The gauge shall indicate the foam concentrate storage tank liquid level on an LED bar graph display.

PRIMING PUMP

One (1) positive displacement, oil less, rotary vane, electric motor-driven priming pump, conforming to the NFPA requirements, shall be provided. The primer pump body shall be fabricated from heat-treated anodized aluminum for wear and corrosion resistance. The priming pump shall be capable of producing a minimum of 20 Hg of vacuum at 2000 feet above sea level.

The primer pump electric motor shall be of a 12 VDC totally enclosed design. The priming pump shall not require lubrication from an external source. The priming pump shall be operated by a single push-pull control valve mounted on the pump operator's panel. The control valve shall be of all bronze construction and labeled #6 Primer.

The primer shall be connected to the priming port provided on the top of the pump inlet.

PRESSURE RELIEF VALVE

The pump shall be equipped with an automatic pressure control device installed in the discharge plumbing. A variable pressure setting relief valve, fabricated from bronze, shall be provided that is of ample capacity to prevent an undue pressure rise as per NFPA requirements. The relief valve shall be normally closed and shall open when pump pressure above the preset limit is supplied to the valve. An indicator light shall be supplied to illuminate when the valve is in the open position. In the event of the failure of the relief valve control, the pump shall remain operable throughout the complete range of the pump's rated capacity, without requiring the closing of any emergency or "in case of failure-off/on" valve.

DISCHARGE LOCATIONS

One (1) 2-1/2" water-only, labeled #19 Water Only, discharge shall be provided at the rear pump operator's panel. The discharge shall be plumbed with stainless steel pipe and/or 2-1/2" flexible high pressure hose, and shall terminate with 2-1/2" NSTM threads with a 2-1/2" NSTF brass cap and chain. The discharge valve shall be controlled at the valve with a TS style handle.

One (1) 1-1/2" discharge, labeled #3 Discharge, plumbed to the on-board foam system, shall be provided at the driver's side of the apparatus, between the chassis cab and the body, near the hose compartment. The discharge shall be plumbed with stainless steel pipe or 1-1/ 2" flexible high pressure hose, and shall terminate with 1-1/2" NSTM threads with 1-1/2" NSTF brass cap and chain. The discharge valve shall be controlled at the valve with a TS style handle.

One (1) 1-1/2" discharge, labeled #3 Discharge, plumbed to the on-board foam system, shall be provided at the passenger's side of the apparatus, between the chassis cab and the body, near the hose compartment. The discharge shall be plumbed with stainless steel pipe or 1-1/ 2" flexible high pressure

hose, and shall terminate with 1-1/2" NSTM threads with 1-1/2” NSTF brass cap and chain. The discharge valve shall be controlled at the valve with a TS style handle.

One (1) 1-1/2" discharge, labeled #3 Discharge, plumbed to the on-board foam system, shall be provided at the passenger’s side of the front bumper extension. The discharge shall be plumbed with 1-1/ 2" flexible high pressure hose with reusable fittings or welded stainless steel pipe. The front bumper discharge shall be equipped with a 1-1/2" quarter turn ball valve installed at the front bumper, controlled at the valve with a TS style handle. The discharge shall have a 90 degree full swivel elbow, terminating in 1-1/2" NSTM threads, to allow the hose to be pulled in any direction without kinking.

One (1) 1-1/2" inline valve, labeled #20, shall be provided to isolate the mid-passenger’s side and front bumper extension discharge piping in the case of a hose or piping failure. This valve shall normally be left in the open position. Control for this valve shall be through the use of a TS or R1 handle at the valve.

Two (2) 1-1/2" NSTM discharges, labeled #3 Discharge, with 2” plumbing and 1-1/2” valves, plumbed to the on-board foam system, shall be provided at the rear pump operator’s panel. The valves shall be mounted outside of the panel for ease of operation and maintenance. The discharges shall have 1-1/2" NSTF brass caps and chains. The discharges shall be controlled at the valves with a TS style handle and shall be plumbed to a drain.

INTAKE LOCATION

One (1) 3" intake, labeled #8 Overboard Suction, shall be provided on the pump operator’s panel at the rear of the apparatus body, plumbed with 3" piping to the intake side of the pump. The intake shall be equipped with a 3" ball valve with a manual locking handle, mounted outside the pump panel at the rear of the apparatus and terminating with a NSTM fitting. A 3” brass cap with chain shall be supplied on the main intake at the rear. A removable screen shall be installed in the intake to prevent debris from entering the pump.

TANK FILL

One (1) 2" Akron, or equivalent, electrically controlled inline valve, labeled #2 Pump to Tank, shall be installed between the pump discharge and the water tank fill inlet. The control for the tank fill line shall be located at the pump operator's panel.

TANK TO PUMP LINE

One (1) 3” Akron, or equivalent, inline valve, labeled #1 Tank to Pump, shall be installed between the water tank outlet and the pump inlet. The valve shall be air actuated and shall be controlled from the pump operator's panel by a heavy duty water-protected toggle valve, equipped with an aircraft-style red protective cover to prevent accidental movement of the switch. The valve and air cylinder shall be installed so that the tank to pump valve is in the "open" position when the cylinder rod is retracted. All valving and piping shall be 3" without restrictions. An access panel shall be provided in the rear wall of the hose reel compartment to allow access to this valve for servicing or replacement.

DIRECT TANK FILL/DRAIN

One (1) 1-1/2" direct tank fill/tank drain, labeled #13 Gravity Drain, shall be provided on the pump operator’s panel, equipped with an Akron 1-1/2" inline valve. The inlet/outlet shall terminate in a 1-1/2" NSTM adapter, with a 1-1/2” NSTF brass cap and chain. A removable screen shall be installed in the inlet. The valve shall be actuated with a manual control handle located on the pump operator’s panel.

BACK PACK FILL

One (1) 3/4" GHT bib type fitting, with cap, shall be provided below the rear step for filling backpacks. The outlet shall be gravity supplied from the water tank and shall be controlled with an inline quarter-turn valve, labeled #18 Backpack Fill, located on the pump operator’s panel.

BOOSTER HOSE REEL

One (1) Hannay brand, Model #EPF 32-23-24 RT, or equivalent, booster hose reel, with a capacity of 150 ft. of 1" booster hose, shall be provided in the compartment located at the center rear of the apparatus body. The hose reel frame shall be fabricated from steel, with a silver painted finish. The hose reel inlet connection shall be a 1", 90 degree swivel, designed to withstand 1000 PSI, which shall be plumbed from the pump with a and a 1" inline valve, controlled with a TS handle, and 1" flexible high pressure hose. The inlet valve, labeled #4 Reel, shall be located near the reel.

The reel shall be provided with a #043 2/3 HP, 12 VDC electric motor for rewinding the hose on to the reel. This motor shall be controlled with a push button momentary switch located at the reel. The booster reel shall have provisions for manual rewind. The pinion shaft for the manual rewind gear shall have an adjustable tension brake, controlled at the reel.

The hose reel shall be equipped with a 1” NPSH male thread.

One (1) polished stainless steel hose roller and 4-way guide assembly shall be provided on the outboard side of the reel.

FOAM PROPORTIONING SYSTEM

The pump system shall be provided with a Foam Pro 2001 foam injection system, plumbed to the specified discharges. This product shall be an automatic foam proportioning system, with electronically controlled, direct concentrate injection occurring on the discharge, or pressure, side of the water pump. The system shall reliably and accurately meter Class A fire suppressant foam concentrates. These foam concentrates are typically proportioned at ratios of 0.2% - 0.5% of foam concentrate in solution. The proportional injection system shall ensure that only the specified amount of foam concentrate is used. The system shall be simple to operate, and shall have a maximum pressure loss of 7 psi at 200 gpm. A microprocessor control device shall be provided which incorporates a closed-loop feedback signal for more accurate proportioning in variable flow conditions. A means shall be provided to prevent foam solution from returning to the pump, suction water source or engine water tank.

The proportioner shall maintain accurate foam concentrate proportioning and injection rates over water discharge flows of 5 to 200 GPM, and shall maintain accurate proportioning and injection rates throughout a range of 0 to 400 PSI. The proportioner shall be provided with a 1-1/2” NPT flowmeter, Foam Pro Model 2660. It shall be installed using 2” victaulic couplings. The system shall provide flexibility in operation by maintaining a constant concentration of foam solution over a variable range of water stream flow rates and pressures. The proportioning rate shall be adjustable from 0.1% to 6% of the corresponding water discharge flow within the accuracy parameters recommended by NFPA.

The system shall be compatible with nozzle aspirating systems, where nozzle flow volumes must be adjustable on demand, while maintaining a constant percent foam solution.

The foam system shall have a pump operator’s panel-mounted digital control module that shall provide a constant readout of GPM of water, foam solution, concentrate rate and amounts discharged at any time during operation. The total readable figure shall be 99,999 gallons. The foam system shall be capable of being calibrated from the pump operator’s panel. Diagnostic testing shall be provided in the readout from the instruments on the pump operator’s panel. A visible low foam concentrate level warning device shall be incorporated into the digital control module.

Foam concentrate shall be provided from the onboard foam concentrate storage tank.

FOAM UPLOAD SYSTEM

An electric foam upload system shall be provided to enable the refilling of the foam concentrate storage tanks from the ground. The foam upload system shall be controlled at the pump operator's panel, utilizing a three-way valve to select from either "Pick Up," "Flush," or "Switch Off" positions. The electric foam refill pump shall be controlled by a momentary switch on the pump operator's panel. The foam concentrate storage tanks shall be equipped with automatic shut off sensors to prevent them from being overfilled. A garden hose thread fitting shall be provided on the pump operator's panel to allow the connection of a suction hose for refilling from standard five (5) gallon foam concentrate storage containers.

PUMP PERFORMANCE TEST AND CERTIFICATION

Upon completion, the apparatus shall undergo a complete pumping test that conforms to the requirements of NFPA Standard 1906 (latest edition) for the size and type of pump provided. The test shall consist of a continuous one-half hour test pumping at rated capacity and rated net pump pressure, a vacuum test of the primer system and plumbing, a tank discharge flow test and a pressure test of the apparatus piping. The chassis engine and transmission, the pump and other components of the apparatus shall show no undue heating, leaks, or other defect. The results of the test shall be documented to establish the performance of the apparatus and to further insure that the unit shall perform satisfactorily when placed into service. The test results shall be certified in writing, with the certification provided to the purchaser for their records at the time of delivery of the completed apparatus.

WATER TANK

CONSTRUCTION

The water tank shall be fabricated from 1/2" thick polypropylene sheet stock. This material shall be a non-corrosive, stress-relieved thermo-plastic, U.V. stabilized for maximum protection.

The water tank shall be so designed to be completely independent of the body structure and compartments, and shall be a modified rectangle in design.

All joints and seams shall be nitrogen-welded inside and out. The top of the water tank shall be fitted with lifting eyes to facilitate ease of removal. The swash partitions shall have vent and air hole openings, both at the top and bottom, to permit the movement of air and water between the internal compartments. The longitudinal swash partitions shall be fabricated from 3/8" polypropylene, and shall extend from the floor of the tank through the cover to allow for positive welding. The transverse swash partitions shall be fabricated from 3/8" polypropylene, and shall extend from the floor of the tank to the underside of the top cover. All swash partitions shall interlock with one another and shall be welded to each other, as well as to the floor and sides of the tank.

The water tank shall have a combination vent and manual fill tower. The fill tower shall be fabricated from 1/2" polypropylene and shall have a minimum outer perimeter dimension of 8" x 8". The tower shall have a 1/4" thick polypropylene screen and a polypropylene hinged cover. Inside the fill tower, halfway down from the top, shall be fastened a vent overflow pipe. The vent overflow shall be fabricated from Schedule 40 polypropylene pipe, with a minimum I.D. of 4”. The vent overflow shall be designed to run through the tank interior and shall exit at least 12” behind the centerline of the rear axle.

The tank cover shall be fabricated from 1/2" thick polypropylene and shall incorporate a three-piece design which allows for the removal of each individual cover section for inspection or repair of the tank interior, if necessary. The tank cover shall be recessed 3/8" from the top of the tank sides and shall be welded to both the sides and the longitudinal baffles. Each of the three cover sections shall have hold downs to assist in keeping the cover rigid under fast filling conditions. These hold downs shall consist of 2" polypropylene dowels, spaced a maximum of 30" apart, fitted and then welded to the transverse partitions. The dowels shall extend through the cover sections and be welded to them. Two of the dowels shall be drilled and tapped to accommodate the tank lifting eyes.

The sump shall have a minimum dimension of 8" x 6" with a 3/4" thick bottom. On all tanks with a bulkhead suction inlet, a 3" Schedule 40 polypropylene pipe sweep shall be provided from the front of the tank to the sump location. The sump shall have a threaded plug located at the bottom of it for a tank drain and clean out.

There shall be two standard tank outlets: one for the tank to pump suction line, which shall be a minimum of a 3" NPTF coupling, and one for a tank fill line, which shall be a minimum of a 1-1/2" NPTF coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

The water tank shall rest on the body subframe cross members, which shall be spaced a maximum of 22" apart. The tank shall be insulated from those cross members by hard rubber insulators, with a minimum thickness of 1/4", glued and mechanically fastened to the cross members to protect the tank from direct contact with the steel body subframe. The tank shall be designed on a free-floating suspension principle and shall not require the use of additional hold downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure.

CLEAN OUT PLUG

The bottom of the tank sump shall be equipped with a 3" NPTF clean out fitting, equipped with a 3” NPTM PVC pipe plug.

TANK CAPACITY

The water tank shall have a usable capacity of 600 gallons.

FOAM TANK

One (1) 25-gallon capacity foam concentrate storage tank shall be provided and plumbed to the on- board foam system. The tank shall be fabricated from polypropylene and shall be designed and fabricated as an integral part of the main water tank. The foam tank shall have a separate fill tower. The foam tank fill tower lid shall be labeled as to the type of foam concentrate contained within the tank.

BODY ELECTRICAL REQUIREMENTS

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" 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. Wiring shall be routed and/or protected to eliminate exposure to moving parts or debris. 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.

ELECTRICAL EQUIPMENT

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

REAR DOT LIGHTING

The rear DOT lighting shall consist of the following components:

TAIL LIGHTS, BRAKE LIGHTS

A pair of Whelen brand, Model # 60R00XRR, or equivalent, red LED combination tail/brake lights shall be provided at the rear of the body, one (1) each side, above the rear step.

TURN SIGNAL LIGHTS

A pair of Whelen brand, Model # 60A00TAR, or equivalent, amber LED arrow style turn signal lights shall be provided at the rear of the body, one (1) each side, above the rear step.

BACK UP LIGHTS

A pair of Whelen brand, Model # 60J000CR, or equivalent, clear halogen back up lights shall be provided at the rear of the body, one (1) each side, above the rear step.

The above DOT lighting shall be provided with a vertical cast aluminum four (4) position frame at the rear of the body, one (1) each side. The frames shall have a polished aluminum finish, and shall also contain the lower Zone "C" warning lights.

LICENSE PLATE BRACKET AND LIGHT

One (1) Weldon brand, Model #9186-23882-30, or equivalent, clear light fixture, with license plate mounting bracket, shall be provided at the rear of the body.

REAR UPPER MARKER LIGHTS

A pair of Weldon brand, Model #9186-1500-10, or equivalent, red LED marker lights, with stainless steel guards, shall be provided at the rear of the body. The lights shall be located in the upper outboard corners of the body, one (1) each side, facing to the rear of the apparatus.

CLUSTER/CLEARANCE LIGHTS AND REFLECTORS

Three (3) Weldon brand, Model #9186-1500-10, or equivalent, red LED marker lights, with stainless steel guards, shall be provided at the rear of the body, below the rear hose bed horizontal exit threshold.

Two (2) Weldon brand, Model #9186-1500-10, or equivalent, red LED marker lights, with stainless steel

guards, shall be provided on the vertical surfaces of the rear step, one each side of the body, facing to the sides of the apparatus.

Two (2) self-adhesive red reflectors, one (1) each side of the body, shall be provided on the lower rear corners of the compartment doors behind the rear wheel wells, facing to the sides of the apparatus.

Two (2) self-adhesive red reflectors, one (1) each side of the body, shall be provided on the lower outboard corners of the body, above the rear step, facing to the rear of the apparatus.

Two (2) self-adhesive amber reflectors, one (1) each side of the body, shall be provided on the forward lower corners of the compartment doors forward of the rear wheel wells, facing to the sides of the apparatus.

REAR DIRECTIONAL LIGHT BAR

One (1) 911EP brand, Model #TD36A, or equivalent, directional light bar shall be provided at the rear of the apparatus body. The light bar shall be 39" wide and shall consist of 12 lamps. The light bar shall be surface- mounted, centered below the upper rear body edge, and shall be controlled by three (3) switches on the cab center console.

SCENE LIGHTS

Three (3) Whelen brand, 900 series, or equivalent, halogen scene lights, with clear 26 degree lenses, shall be provided and installed as specified below. Each light shall be wired to an individual switch on the cab center console.

One (1) on the upper rear passenger's side of the body, facing to the rear of the apparatus.

One (1) on the upper passenger's side of the body, centered front to rear, facing to the side of the apparatus.

One (1) on the upper driver's side of the body, centered front to rear, facing to the side of the apparatus.

COMPARTMENT LIGHTS

Four (4) TruckLite brand, or equivalent, 2" diameter rubber-mounted compartment lights shall be provided in each compartment, recess-mounted in the side walls. Two (2) lights shall be mounted on each compartment side wall, located one (1) above the compartment shelf, and one (1) below the compartment shelf.

One (1) TruckLite brand, or equivalent, 4" diameter rubber-mounted light, with a clear lens, shall be recess-mounted in the inside door panel of the compartments listed below. The wiring for the lights shall be routed inside the door to the hinged side, where it shall exit the door and run in flexible loom from the corner of the door inner panel to the compartment interior. The loom from the door to the compartment shall be secured in such a manner so that it does not interfere with the removal and replacement of equipment in the compartment.

One (1) light shall be provided on all compartment doors.

Door ajar and compartment light switches shall not be provided in the compartment door jambs. The compartment lights shall be controlled with a master switch on the pump operator's panel.

HOSE BED AREA LIGHTING

Two (2) TruckLite brand, or equivalent, 4" diameter rubber-mounted lights, with clear lenses, shall be provided on the inside surfaces of the hosebed covers, one (1) on each cover section. The lights shall be located near the non-hinged side of the cover sections to provide illumination of the hose bed area. The

lights shall be controlled by a switch on the pump operator's panel.

ELECTRICAL SYSTEM PERFORMANCE TEST, LOW-VOLTAGE

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 purchaser with the documentation for the completed apparatus. The tests shall be performed when the air temperature is between 0°F and 110°F (18°C and 43°C).

TEST SEQUENCE

The three (3) 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.

RESERVE CAPACITY TEST

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.

ALTERNATOR PERFORMANCE TEST AT IDLE

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.

ALTERNATOR PERFORMANCE TEST AT FULL LOAD

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 (2) 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 VDC for a 12 VDC nominal system, for more than 120 seconds, shall be considered a failure of this test.

LOW VOLTAGE ALARM TEST

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.

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 11.70VDC for a 12 VDC 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.

DOCUMENTATION

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

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

APPARATUS FINISH

BODY FINISH PROCEDURE

All exposed steel surfaces shall be thoroughly cleaned and prepared for finish painting.

All removable items, such as brackets and compartment doors, shall be removed and painted separately to insure finish paint behind them after they are reinstalled.

All compartment door interior panels shall be left unpainted in a natural aluminum finish.

The apparatus body shall be masked as needed to prevent the painting of unwanted areas and overspray damage. Due to its modular design, the apparatus body shall be completely finish painted prior to its installation on the chassis.

All exterior surface scratches and blemishes shall be filled with body putty and sanded down, along with all primed surfaces.

The complete apparatus body shall be cleaned, blown free of dust; washed with thinner; and wiped with tack cloths. A non-sanding primer shall be applied and when dry, the apparatus body shall be sprayed with three (3) coats of finish paint. All loose body components shall be treated in the same manner.

Any irregularity in any painted surface shall be repaired prior to the application of the finish paint coats.

The compartment interiors are to be sealed for leaks and the inside surface areas cleaned and prepped, then finish painted with Zolatone #20-11 (Apollo Gray).

APPARATUS BODY COLOR

The apparatus body shall be painted to match the color of the chassis cab exterior. The chassis cab shall not be repainted. The color of chassis cab exterior and body shall be No. 14260 of Federal Standard No. 595 (Forest Service Green).

CHASSIS FINISH

The chassis cab exterior paint finish shall be supplied by the chassis manufacturer.

STRIPING

A 4" wide white 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. A break shall be provided in the striping on either side of the apparatus body approximately over rear wheel centerline. The ends of the horizontal stripe shall be sloped at approximately 45 degrees on either side of the break.

CAB AND BODY LETTERING AND STRIPING

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

The word “FIRE”, in 4" tall white letters, shall be centered in the break in the horizontal 4” stripe on the compartment doors on each side of the body, approximately over rear wheel centerline.

The unit designator and equipment designator (Example CA-BDF-E351), in 8" tall white letters, shall be provided on the forward and center compartment doors, above the 4” stripe, on each side of the

apparatus body.

The words “U.S.D.A.,” “FOREST SERVICE” in 3” tall green letters, “FIRE” in 4" tall green letters; and the unit designator (example: CA-BDF) and equipment designator (example: E351), in 6" tall green letters, shall be provided on the roll up rear compartment door. The lettering at the rear of the apparatus shall be arranged as follows:

U.S.D.A.
FOREST SERVICE
FIRE
CA - BDF - E351

The unit designator, in 6" tall white letters, shall be provided centered on the swept back portion of the front bumper on the passenger’s side, and the equipment designator, in 6" tall white letters, shall be provided centered on the swept back portion of the front bumper on the driver’s side.

The unit designator, in 18” tall black letters, shall be provided on the cab roof, aft of the light bar, and the equipment designator, in 18” tall black letters, shall be provided on the cab roof below the unit designator.

The apparatus manufacturer shall install Government-supplied door decals (shield and vehicle numbers) on the front cab doors, below the reflective striping.

TRUCK IDENTIFICATION PLATE

A durable truck identification plate, fabricated from corrosion resistant metal, shall be provided and installed on the pump operator's panel. The plate shall state the name and address of the apparatus manufacturer, the serial number of the unit and the pump performance test results.

EQUIPMENT

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.

MANUALS AND DRAWINGS

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

One (1) complete set of standard chassis operation, parts and service manuals.

One (1) apparatus manufacturer's operation and service manual, to include:

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

ROAD KIT

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

One (1) 2-1/2 lb. Class B/C fire extinguisher with vehicle mounting bracket, shipped loose

One (1) set of warning triangle reflectors, containing three (3) folding reflectors in a plastic storage case

One (1) 12 ton hydraulic jack with handle

WHEEL CHOCKS

Two (2) Worden brand, Model #HWC-7 wheel chocks shall be provided with the completed apparatus.

TOOL HOLDERS

One (1) set of tool holders, per USFS design, shall be purchased or fabricated from stainless steel and/or steel with a gray Dura Coat finish. The tool holders shall be shipped with the loose equipment accompanying the completed apparatus.

NOZZLE MOUNTS

The following quantities and sizes of nozzle holders shall be provided with the completed apparatus:

Six (6) 3/4" GHT
Seven (7) 1" NPSH
Two (2) 1-1/2" NPSH
Eleven (11) 1-1/2" NH
Two (2) 2-1/2" NH
One (1) 2-1/2" NH quick release

WARRANTY PROVISIONS

ONE (1) YEAR APPARATUS WARRANTY

All materials and workmanship herein specified, including all equipment furnished, shall be guaranteed for a period of one (1) year after the acceptance date of the apparatus, unless otherwise noted, with the exception of any normal maintenance services or adjustments which shall be required.

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.

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.

WATER TANK WARRANTY

The polypropylene water tank that is specified to be supplied with this apparatus shall be warranted by the water tank manufacturer for a "lifetime" period from the date that the apparatus is put into service. The manufacturer shall repair, at no cost to the purchaser, any problems caused by defective materials and/or workmanship. The warranty shall cover the reasonable costs of removing the water tank from the apparatus and reinstalling it after the completion of the covered warranty repairs, but shall not cover any liability for the loss of service or downtime costs of the apparatus.

APPARATUS OPTIONS

SELF-CONTAINED BREATHING APPARATUS (SCBA) SEATING

Three (3) specially-designed individual seats, with SCBA backrests, shall be provided and installed to replace the OEM rear crew bench seat provided with the chassis. The replacement seats shall have an adjustable height riser, 11-degree tilt capability, a removable parade pad and armrest sockets. The center seat shall be provided with two (2) armrests and the outboard seats shall each be equipped with one (1) inboard armrest

SPARE SCBA BOTTLE STORAGE

Four (4) SCBA spare bottle storage compartments, each with a bright aluminum diamondplate door and quarter turn latch, shall be provided in the wheel well areas, two (2) each side of the apparatus body, forward and aft of the rear wheel well openings.

WHEEL CHOCK STORAGE COMPARTMENTS

Two (2) aluminum storage compartments, mounted in rear cab step, shall be provided, one each side of apparatus. The compartment box shall be divided into two (2) storage areas. One storage area with dimensions approximately, 9”W X 7-1/2”H X 24”D shall store the apparatus’ wheel chock ~~block~~. The second storage area shall have approximate dimensions of 7-1/2”W X 7-1/2”H X 24”D. Storage compartment door shall be diamond plate, with vertical hinge and compression latch. The door shall have approximate dimensions of 21”W X 8”H.

CHAINSAW BRACKET

One (1) vertical chainsaw bracket shall be provided and installed in the passenger side forward vertical compartment.