1500 Challenger Top CAFS Pumper

CH006

00-00-4100

APPARATUS PROPOSAL SPECIFICATIONS

Darley Apparatus

For

Department Name

City, State

Representative Name:
Date:
CH006

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1500 Challenger Top CAFS Pumper

CH006

00-00-9500

THANK YOU

Thank you for the opportunity to present these specifications. Our company looks forward to working with you, to provide the best service possible, and the best product possible, as detailed within these specifications.

00-01-0000

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FIRE APPARATUS SPECIFICATIONS

00-05-1000

PRODUCT QUALITY AND WORKMANSHIP

The components provided and workmanship performed shall be of the highest quality available for this application. Special consideration shall be given to the following areas:

A). Accessibility to various components that require periodic maintenance or lubrication checks.

B). Ease of vehicle and pump operation.

C). Features beneficial to the intended operation of the apparatus.

Construction of the complete apparatus shall be designed to carry the loads intended to meet the road and terrain conditions and speed requirements desired when specified by the purchaser.

Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the removal of any major component part for service and/or repair.

00-15-0600

PAYMENT REQUIREMENTS

00-15-1500

The Purchaser shall provide payment for the chassis upon chassis completion and invoice from the apparatus manufacturer.

The balance of the contract shall be paid by the Purchaser upon completion of the apparatus and invoice from the apparatus manufacturer.

00-50-0600

DRAWING REQUIREMENTS

00-50-1000

APPARATUS PROPOSAL DRAWINGS

All bidders shall submit, with their proposal, a minimum of one (1) set of drawings of the apparatus as proposed. The drawings shall include left side, right side, top, front, and rear views of the apparatus.

Critical dimensions such as overall height, overall length, body width, cab dimensions, pump module dimensions (when applicable), compartment dimensions, and overall body dimensions shall be on the drawings.

Water tank size (when applicable) and pump gpm (when applicable) shall also be stated on the drawings.

00-50-2000

CONSTRUCTION APPROVAL DRAWINGS

Prior to construction, two (2) sets of apparatus drawings shall be supplied to the purchaser. The drawings shall include left side, right side, top, and rear views of the apparatus.

Critical dimensions such as overall height, overall length, body width, cab dimensions, pump module dimensions (when applicable), compartment dimensions, and overall body dimensions shall be on the drawings.

Water tank size (when applicable) and pump gpm (when applicable) shall also be stated on the drawings.

The purchaser shall review the drawings. Any discrepancies and/or mutually agreed upon modifications

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shall be noted on the drawings. The purchaser shall return one complete set of drawings, with authorized approval signature(s), to the manufacturer's representative.

00-55-0750

WARRANTY REQUIREMENTS

00-55-1450

WARRANTY

The following warrantees shall be provided:

00-55-2200

ONE YEAR APPARATUS WARRANTY

The complete apparatus detailed herein shall be warranted against defects in materials and workmanship for a period of twelve (12) months, effective upon pick up or delivery of the completed apparatus to the purchaser, as detailed in the respective warranty documents.

A copy of the warranty verbiage shall accompany the bid.

Other warrantees, as provided by individual component manufacturers may extend beyond this warranty.

00-55-4800

LIFETIME FIRE PUMP WARRANTY

The bidder shall provide a lifetime warranty against defects in material and workmanship for the fire pump as provided and installed in the apparatus proposed.

A copy of the fire pump manufacturer's warranty document shall be included with the bidder's proposal.

00-55-5500

LIFETIME TANK WARRANTY

The poly type material water tank and/or foam tank provided shall be warranted for the life of the apparatus as detailed and provided by the tank manufacturer.

00-56-2000

APPARATUS BODY WARRANTY

The apparatus body as detailed herein shall have a structural warranty against defects in materials and workmanship for a period of ten (10) years, effective upon final payment in full by the Purchaser, and pick up or delivery of the completed apparatus to the Purchaser. A warranty document shall be included.

00-57-1550

TEN YEAR PAINT WARRANTY

The finish paint as used on the proposed apparatus shall be warranted against defects in materials and workmanship for a prorated period of ten (10) years, effective upon pick up or delivery of the completed apparatus to the purchaser, as detailed in the respective warranty documents. A copy of the warranty verbiage shall accompany the bid.

00-57-5200

ONE YEAR EQUIPMENT WARRANTY

The equipment detailed herein shall be warranted against defects in materials and workmanship for a period of twelve (12) months, effective upon pick up or delivery of the equipment to the purchaser.

Other warrantees, as provided by individual equipment manufacturers may extend beyond this warranty.

00-68-0500

MANUAL AND DATA REQUIREMENTS

00-68-1500

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FIRE APPARATUS DOCUMENTATION

At the time of delivery, two (2) copies of the following shall be supplied:

The manufacturer's record of construction details, including the following:

(a) Owner's Name and address.
(b) Apparatus manufacturer, model and serial number.
(c) Chassis manufacturer, make, model, and serial number.
(d) GVWR of front and rear axles.
(e) Front tire size and total rated capacity in lbs.
(f) Rear tire size and total rated capacity in lbs.
(g) Chassis weight distribution in pounds with water and manufacturer mounted equipment (front and rear).
(h) Engine make, model, serial number, rated horsepower and related speed, and governed speed.
(i) Type of fuel, and fuel tank capacity.
(j) Electrical system voltage and alternator output in amps.
(k) Battery make, model, and capacity in cold cranking amps (CCA.).
(l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s), make model, and gear ratio.
(m) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number.
(n) Pump transmission make, model, serial number, and gear ratio.
(o) Auxiliary pump make, model, rated capacity in gallons per minute (liters where applicable), and serial number.
(p) Water tank certified capacity in gallons or liters.
(q) Aerial device type, rated vertical height in feet, rated horizontal reach in feet, and rated capacity in pounds.
(r) Paint manufacturer and paint numbers.
(s) Company name and signature of responsible company representative.

2.) Certification of slip resistance of all stepping, standing, and walking surfaces.
3.) Manufacturer's certification of pump suction capability (when a pump is present).
4.) A copy of the apparatus manufacturer's approval for stationary pumping applications (when a pump is present).
5.) Engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed (when a pump is present).
6.) If the apparatus has a fire pump or an industrial supply pump, the pump manufacturer's certification of the hydrostatic test.
7.) If the apparatus has a fire pump or an industrial supply pump, the certification of inspection and test for the fire pump, or the industrial supply pump.
8.) If the apparatus has an aerial device, the certification of inspection and test for the aerial device.
9.) If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1914.
10.) If the apparatus has a fixed line power source, the certification of the test for the fixed power source.
11.) If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation.
12.) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus [with the water tank full (when present) but without personnel, equipment, and hose].
13.) Written load analysis and the results of the electrical system performance tests required.
14.) When the apparatus is equipped with a water tank, the certification of water tank capacity.

OPERATIONS AND SERVICE DOCUMENTATION

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A minimum of two (2) sets of complete operation and service documentation shall be supplied, covering the completed apparatus as delivered and accepted. The documentation shall address the inspection, service, and operation of the apparatus and major components thereof.

Documentation shall also be provided for the apparatus, and major components and operating systems as follows:

1.) Manufacturer's name and address.
2.) Country of Manufacturer.
3.) Source for service and technical information.
4.) Parts replacement information.
5.) Descriptions, specifications, and ratings of the chassis, pump (if present), and aerial device (when present).
6.) Wiring diagrams for low voltage, and line voltage systems, including the following:

a.) Pictorial representation of circuit logic for all electrical components and wiring.
b.) Circuit identifications.
c.) Connector pin identification.
d.) Zone location of electrical components.
e.) Safety interlocks.
f.) Alternator and battery power distribution circuits.
g.) Input/output assignment sheets, or equivalent circuit logic implemented in multiplexing systems.

7.) Lubrication charts.
8.) Operating instructions for the chassis, any major components, such as a pump or aerial device, and any auxiliary systems.
9.) Precautions related to multiple configurations of aerial devices, if applicable.
10.) Instructions regarding the frequency and procedure for recommended maintenance.
11.) Overall apparatus operating instructions.
12.) Safety considerations.
13.) Limitations of use.
14.) Inspection procedures.
15.) Recommended service procedures.
16.) Trouble shooting guide.
17.) Apparatus body, chassis, and other components manufacturer's warranties.
18.) Special data required by the standard.
19.) Copies of required manufacturer's test data or reports, manufacturer certifications, and independent third party certifications of test results.
20.) A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus.

00-80-0500

CHASSIS PROVIDER

00-80-1000

The chassis, as detailed in these specifications, shall be ordered and supplied by the apparatus manufacturer. The chassis portion of the contract shall be paid for as detailed elsewhere in the specification package.

01-10-0015

CAB AND CHASSIS

The cab and chassis shall be a Spartan Chassis, Inc. Flat Floor Big Easy, model VA41M, medium four door with a 10" raised roof, flat floor, aluminum tilt cab, built specifically for the fire service by a publicly held U.S. parent company, specializing in chassis for fire service applications.

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08-00-0005

FLAT FLOOR MFD 10" RAISED ROOF TILT CAB

The cab shall be a Spartan Chassis Flat Floor, MFD (medium four door), 10" raised roof, aluminum tilt cab, capable of seating six (6) firefighters.

The raised roof shall extend from the back of the cab to the center of the front doors to provide additional headroom for the driver and officer.

The cab shall be of the Eurospace interior design allowing for easy communication inside the cab. The cab overall length shall be 128.0" with 54.0" from the centerline of the front axle to the back of the cab.

The rear cab wall shall be 0.090" thick aluminum. The rear floor to the headliner height shall be approximately 65.0".

The cab front skin and floor shall be 0.190" thick aluminum. The inside width shall be 88.0" and the front floor to headliner height above the driver and officer shall be approximately 65.0".

All glass used in the cab shall be automotive tint. The windshield shall have a maximum of 2808 square inch area and be of the wraparound design, 52.0" wide and 27.0" high for maximum visibility. The left and right windshield shall use the same interchangeable piece of glass.

A molded rubber 11" grab handle shall be provided on the hinge post inside the cab at the driver, officer and crew doors for entering and exiting the cab.

The driver and officer seats shall have an 8" high x 16.25" wide x 18.75" deep compartment in the seat box beneath them. The compartment shall have an opening of 6" high x 14.25" wide.

Intermittent parallel arm-type electric wipers with separate motors and electric powered "wet arm" type windshield washers shall be provided. Access to the wiper motors shall be through an access panel located on the front cab face.

08-13-0005

CAB WINDOWS

Fixed cab side windows, 16.0" x 26.0" (416 square inches) shall be installed behind the front cab doors one each side of the cab. Each window shall be the same height as the windshield to provide maximum visibility.

08-13-0100

FRONT AND REAR ROLL DOWN DOOR WINDOWS

The front doors shall have a full roll down window 27.00" x 26.00" with a total glass area of 702 square inch each.

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The rear doors shall have a roll down window 27.50" x 26.00" with a total glass area of 715 square inch each.

08-15-0006

CAB DOORS

The cab doors shall be flush, full length type with hidden .375" stainless steel door hinges. All doors shall be equipped with exterior pull handles, suitable for use with firefighter mittens, and keyed alike locks that are designed to prevent accidental lockout.

The interior latches shall be flush paddle type, which are incorporated into an upper door panel.

The front doors shall measure 43.00" wide x 77.00" high with .13" thick aluminum skins. The steps shall be a two (2) step configuration with the lower step constructed of an open grate material and the intermediate step shall be covered with black flextread.

The following measurements shall apply:
First step: 11.00" deep x 32.00" wide
Intermediate step: 8.75" deep x 33.00"wide
Ground to first step: approximately 21.00"
First step to intermediate step: 11.00"
Intermediate step to floor: 11.00"

The rear doors shall measure 34.00" wide x 87.00" high with .13" thick aluminum skins. The rear steps shall be a two (2) step configuration with the lower step constructed of an open grate material and the intermediate step covered with black flextread.

The following measurements shall apply:
First step: 11.00" deep x 21.50" wide
Intermediate step: 11.50" deep x 23.50" wide
Ground to first step: approximately 21.00"
First step to intermediate step: 12.50"
Intermediate step to floor: 12.50"

02-04-0000

CHASSIS ALIGNMENT

The chassis frame rails shall be cross checked for length and squareness. Front and rear axles shall be laser aligned. Tires and wheels shall be aligned and toe-in set on the front tires at the chassis manufacturer's facility.

The completed apparatus should be rechecked for proper alignment after the chassis has been fully loaded.

02-10-0025

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CHASSIS WHEELBASE

The chassis wheelbase shall be 210" and the AE is 51".

The wheelbase shall be approximately 204".

02-01-0003

FRAME

The frame side rails shall be black powder coated "C' channel type 10.25" x 3.5" x .38" with an inner channel 9.44" x 3.13" x .25" of 110,000 psi minimum yield high strength steel, a RBM of 2,759,702 inch pounds and a section modulus of 25.09 cubic inches.

A minimum of seven (7) fully gusseted bolted assembly crossmembers shall be installed using grade 8 flanged head bolts and flanged lock nuts.

The area between the axle suspension hangers shall be free of any holes or fasteners in the flanges. No welding shall be incorporated in attachment of components. All frame dimensional cutting shall be by a plasma cutter. All relief areas shall be cut in with a minimum 2" radius at intersection points with ground smooth edges to prevent a stress focal point.

The frame and crossmembers shall carry a lifetime warranty to the original purchaser.

02-15-0005

FRONT BUMPER

A one-piece, 10 gauge 304, polished stainless steel front bumper shall be provided. The bumper shall be a 12" high, two (2) rib wrap-around type.

The bumper shall be extended 24" ahead of the cab.

02-20-0020

AIR HORNS

Dual Hadley model #H00912A Stuttertone 24" air horns shall be installed behind the 24" front bumper extension in the center. A 1/4" airline "teed" equal distance from each horn shall supply the air horn system.

06-05-0030

ADDITIONAL AIR RESERVOIR

An additional 1200 cubic inch air reservoir shall be installed and isolated to prevent depletion of the air to the air brake system and to act as a supply tank for operating air equipment. It shall be plumbed with a 90 psi pressure protection valve on the reservoir supply side.

02-21-0005

AIR HORN ACTUATION

Air horn actuation shall be accomplished by the steering wheel horn button and a right side

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officer's mounted Linemaster SP491-S81 foot switch.

02-24-0005

FRONT TOW HOOKS

Two (2) painted steel tow hooks shall be bolted to the frame under the front bumper.

03-00-0005

FUEL TANK

The fuel tank shall have a minimum capacity of fifty (50) gallons. The baffled tanks shall be made of 14 gauge phosphate coated steel with chromate epoxy exterior finish.

The fuel tank shall be mounted under the frame, behind the rear axle with a three-piece strap hanger assembly with a "U" strap bolted midway on the fuel tank front and rear so the tank can be easily lowered and removed for service purposes. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

The tank shall have a vent port to facilitate rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2"NPT fill ports for right or left hand fill. A .5"NPT drain plug shall be centered in the bottom of the tank.

The standard fuel line for ISC and ISL engines shall be nylon material rated for diesel fuel. All other engines shall be steel wire braid reinforced rubber.

04-00-0005

FRONT AXLE

The front axle shall be an ArvinMeritor MFS-18 with a 3.74" drop and a 71.00" KPI. It shall have a capacity of 18,000 pounds GAWR.

Suspension

The springs shall be elliptical type, four (4) leaf, 54" long, 4" wide with a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counterbore and lubrication land off crossbore with grease fitting. The spring capacity shall meet or exceed the capacity of the front axle.

Steering

The hydraulic power assist steering gear shall be a TRW TAS-85. A Vickers hydraulic power steering pump shall be gear driven from the engine. The steering ratio shall be 23.3:1 and have 6.2 turns stop to stop.

04-06-0005

FRONT WHEEL BEARINGS OIL LUBRICATED

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The front axle wheel bearings shall be oil lubricated and come equipped with an oil level visual inspection window.

04-07-0005

FRONT BRAKES

The front brakes shall be ArvinMeritor 16.5" x 6" S-cam type with ArvinMeritor automatic slack adjusters.

04-10-0005

FRONT SHOCK ABSORBERS

Two (2) Bilstein monotubular design, nitrogen gas charged shock absorbers shall be part of the front axle suspension. Bilstein shall warranty the shock for a period of five (5) years.

04-20-0010

FRONT TIRES

The front tires shall be Michelin 315/80R 22.5 20PR "L" tubeless radial XZA1 highway tread with 22.5 x 9.0 ten (10) stud disc wheels. The tires and wheels shall be rated at 18,000 pounds.

04-70-0005

FRONT AXLE CRAMP ANGLE

The hub piloted, MFS-18 model front axle cramp angle shall be a minimum of 50 degrees when using the 315/80R 22.5 front tires.

04-40-0005

FRONT WHEELS STEEL

The front wheels shall be Accuride hub piloted, 9.00" x 22.5" steel wheels.

05-00-0005

REAR AXLE

The rear axle shall be an ArvinMeritor model #RS-24-160 with single reduction gearing and shall have a rated capacity of 24,000 pounds GAWR.

05-06-0005

OIL LUBRICATED REAR WHEEL BEARINGS

The rear axle shall have oil lubricated wheel bearings.

05-07-0005

REAR BRAKES

The rear brakes shall be ArvinMeritor 16.5" x 7" S-cam type with ArvinMeritor automatic slack adjusters.

05-09-0010

TOP SPEED

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

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RPM.

05-10-0005

REAR SUSPENSION

The rear suspension shall be a Reyco 79KB vari-rate, captive slipper type, with 57.5" x 3" springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The spring capacity must meet or exceed the capacity of the rear axle.

05-15-0005

REAR TIRES

The rear tires shall be Michelin 11R 22.5 16PR "H" tubeless radial XZE highway tread with a minimum rating of 24,020 pounds.

05-20-0005

REAR WHEELS

The single rear axle wheels shall be Accuride hub piloted, 8.25" x 22.5" steel.

06-00-0005

ABS BRAKE SYSTEM

A Meritor Wabco four sensor four modulator anti-lock braking system shall be installed on the front and rear ArvinMeritor axles for safer vehicle control during braking and reduced stopping distance in skid conditions.

The electronic monitoring system shall incorporate diagonal circuitry to monitor wheel speed during braking through a sensor and tone ring on each wheel.

A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. A momentary test switch shall be installed to test the system for diagnostic codes.

The ABS system shall automatically disengage the auxiliary braking system device when required.

The Meritor Wabco ABS system shall have a three (3) year or 300,000 mile warranty provided by Meritor Wabco Vehicle Control Systems.

06-01-0005

SINGLE REAR AXLE AIR BRAKE SYSTEM

A FMVSS 121 and NFPA rapid build-up, compliant air brake system shall be provided. It shall include three (3) air reservoirs with a total of 4136 cubic inches of air capacity.

A Bendix E6 floor mounted tread valve shall be mounted in the cab for service brake control.

A Bendix PP1 control valve shall operate the parking brake system.

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Emergency braking shall be controlled through the Bendix treadle valve and modulated through a Meritor Wabco inversion valve.

The rear axle spring brakes are to automatically apply in case of air pressure loss below 60 psi with a mechanical means for releasing the spring brake chambers.

05-09-0005

DRIVELINES

All drivelines shall be Spicer 1710 heavy duty series with 'glide coat' splines on all slip shafts.

06-05-0005

AIR DRYER

A Meritor Wabco system saver 1200 spin-on desiccant air dryer with a 12-volt, 100-watt automatic heated moisture ejector shall be installed in the air brake system.

The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure.

The Meritor Wabco air dryer shall come with a three (3) year or 300,000 mile warranty provided by Meritor Wabco Vehicle Control Systems.

06-05-0015

MANUAL DRAINS ON AIR TANKS

Manual drains shall be installed on all reservoirs of the air brake system.

06-05-0025

NYLON AIR LINE TUBING

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

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall be fiber reinforced neoprene covered hoses.

07-00-0005

ENGINE

A Cummins ISC-330 turbocharged, air charge cooled engine shall be provided.

Type:
In-Line six (6) cylinder, 4 cycle

Horsepower:

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330 @ 2000 rpm (Governed @ 2200 rpm)

Torque:
950 lbs.ft. @ 1300 rpm

Displacement:
504.5 cubic inch

Governor:
Electronic

The engine wiring harness shall include circuits for multiplex Borg Warner gauges, engine oil pressure warning lamp, engine temperature warning lamp, hand throttle, high idle, PSG systems and a J1939 data link in the drop out at the back of the cab. The harness shall end in connector to allow an optional pump panel harness be plugged into it.

An engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge shall be part of the engine's lubrication system.

An external mounted transmission cooler shall be part of the engine cooling system.

07-05-0005

ENGINE EXHAUST BRAKE

A Jacobs extarder engine exhaust brake shall be installed in the engine exhaust system to serve as an auxiliary braking device. An on/off switch shall be located on the instrument panel. The driver releasing the accelerator shall activate the exhaust brake when the switch is in the "on" position.

The exhaust brake shall activate an aggressive downshifting of the transmission to enhance the exhaust brake performance.

07-06-0005

AIR COMPRESSOR

The air compressor on the engine shall be a Wabco capable of producing a minimum of 18.7 cfm at 1250 engine rpm. It shall be gear driven, engine oil pressure lubricated and cooled by the engine cooling system. The air compressor shall have a five (5) year warranty.

07-06-0014

FUEL FILTER - CUMMINS ENGINE

Two (2) Fleetguard fuel filters shall be provided. A combination primary fuel/water separator shall be remote mounted on the cross member behind the transmission complete with a water-in-fuel (WIF) sensor. If water is present in the fuel the sensor shall activate the WIF light and alarm in the instrument panel.

A secondary filter shall be installed on the engine between the fuel pump and the injectors.

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07-07-0005

EXHAUST SYSTEM

The single pipe exhaust system shall be installed under the right side frame with the discharge forward of the rear tires.

The exhaust system shall consist of an aluminized steel muffler, 0.065" wall aluminized steel exhaust pipe supported by bolted on frame brackets, stainless steel flex tubing between the engine and muffler and overlapping band clamps for the system joints.

07-09-0005

COOLING SYSTEM FAN

The engine cooling system shall incorporate a heavy-duty composite fan, belt driven on the engine on the engine. A shroud and recirculation shield system shall be used to ensure air that has passed through the radiator is not drawn through it again.

07-10-0005

TRANSMISSION

The transmission shall be an Allison 3000 EVS automatic with electronic controls. The transmission shall have two (2) 10-bolt PTO pads.

The transmission shall be equipped with an air to oil transmission cooler located below the radiator allowing a single depth core and efficient cooling package. The transmission cooler shall be mounted in a manner to allow maximum approach angle by not protruding below the frame more than an inch. The transmission cooler shall be constructed completely of aluminum with welded side tanks. The transmission shall have two (2) internal oil filters.

Fourth gear hold-in range may be accomplished by wiring for a pumping application.

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
6th	0.64:1 (if applicable)
Rev	5.03:1

07-16-0001

TRANSMISSION COOLING SYSTEM

Transmission Cooler

The transmission cooler shall be a tube bundle type. The tube bundle cooler shall be mounted to the chassis, plumbed into the engine cooling system plumbing.

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07-20-0005

TRANSMISSION MODE

The transmission, upon start-up, shall select four (4) speed operation. By pressing the "mode" switch on the shift pad (mode on) provides five (5) speed overdrive.

07-25-0005

SYNTHETIC TRANSMISSION FLUID

Castrol "Transynd" or an equivalent synthetic TES 295 transmission fluid shall be utilized to fill the EVS transmission.

13-03-0005

TRANSMISSION WARRANTY

The Allison 3000 EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

07-30-0004

COOLING SYSTEM

The cooling system shall have sufficient capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the engine and transmission manufacturer and EPA requirements. The complete cooling system shall be mounted in a manner to isolate the system from vibration and stress. The individual cores shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining core(s).

Radiator

The radiator shall be a down-flow design constructed brass/copper with plastic tanks. The radiator shall have a minimum of a 909 square inch core and located behind the charge air cooler.

Surge Tank

The cooling system shall be equipped with a surge tank that is capable of being filled and removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a cap that meets the engine manufactures pressure requirements as well as the system design requirements.

Coolant

The cooling package shall have standard ethylene glycol installed. The use of supplemental coolant additives (SCA) shall not be allowed as part of the coolant filter. The coolant shall contain ethylene glycol and water to keep the coolant from freezing to a temperature of -34 degrees F.

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Coolant Filters

Engines equipped with coolant filters shall be supplied chemical type filters.

Hoses/Clamps - Radiator

All radiator tubes shall be formed from aluminized steel tubing and installed with silicone hoses with stainless steel constant torque clamps.

Recirculation Shields

Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting the performance.

Charge Air Cooler

The charge air cooler shall be a cross-flow design constructed completely of aluminum with welded side tanks. The charge air cooler shall have a minimum of a 710 square inch core and shall be located in front of the radiator.

Hoses/Clamps - Charge Air Cooler

All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "T" style clamps meeting the engine manufactures requirements.

13-02-0005

ENGINE WARRANTY

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

07-08-0005

AIR CLEANER

The air cleaner shall be Farr #62891-001 dry type with a replaceable element, it shall have an outside air intake with an ember separator filter and an indicator light in the warning light cluster to show when the air cleaner element requires replacement.

07-15-0005

TRANSMISSION TOUCH PAD

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and reach.

08-05-0005

STEERING COLUMN AND WHEEL

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The Douglas Autotech steering column shall be a seven (7) position tilt and 2.25" telescopic type with an 18" steering wheel. The steering wheel shall be covered with black absorbite padding.

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

08-06-0005

INTERIOR TRIM AND FLOOR MAT

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

The pebble grain, non-slip vinyl covered, foam backed, sound deadening, multi-layer insulating floor mat shall be gray. This floormat shall be two ply material with 0.25" thick closed cell foam and a 0.06" thick wear surface.

08-07-0005

HEATER/DEFROSTER

A 57,600 Btu, front overhead heater and defroster shall be provided. The heater shall be located above the windshield between the padded sunvisors and contain the temperature and blower controls.

All heater system hoses, including auxiliary units shall be silicone with stainless steel constant torque clamps approved for use with silicone hose.

08-08-0005

AIR-CONDITIONING

The cab shall be equipped with a combination heater air-conditioning unit mounted on the engine tunnel.

The combination heater/air-conditioning unit has eight (8) adjustable louvers, a temperature control valve and two (2) three speed blowers capable of circulating 550 cubic feet of air per minute. This unit is rated at 42,500 BTU for cooling and 36,000 BTU for heating.

The air-conditioning condenser is 42.0" wide x 10.46" deep x 10.0" high. It is capable of circulating 1250 cubic feet of air per minute and is rated at 41,000 BTUs. The condenser will be located in the center of the roof forward of the raised roof against the slope.

The air-conditioning compressor shall be an engine driven Seltec TM-16 and utilize R-134A refrigerant.

A seasonal shut-off valve for the heater shall be supplied at the front of the right hand corner of the cab.

08-09-0005

CAB TILT ACTUATION

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The entire cab shall tilt 45 degrees to allow for easy maintenance of the engine and transmission.

The cab tilt actuation shall be with an electric over hydraulic lift pump with a control box on a pennant for safe visual operation.

The lift system shall have an ignition interlock and red lock down indicator lamp, which shall illuminate when holding "down" switch to indicate safe road operation. It shall be necessary to activate the master battery switch with the park brake set in order to tilt the cab.

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

Two spring loaded hydraulic hold down hooks outboard of the frame shall be installed for holding the cab securely to the frame.

A steel safety assembly shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety assembly shall fall over the lift cylinder when the cab is in the "up" position. A cable release system shall also be provided to clear the safety assembly from the lift cylinder when lowering the cab.

08-10-0006

WHEEL WELL LINERS

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. The two-piece liners shall consist of an inner liner 16" wide made of ABS plastic and a outer fenderette 3.50" wide made of 12 gauge polished aluminum.

08-11-0005

EXTERIOR CAB ASSIST HANDLES

Four (4) 18" knurled anti-slip one-piece exterior assist handles shall be installed, one (1) behind each cab door. The assist handle shall be made of 14 gauge 304 stainless steel and be 1.25" diameter to enable easy grabbing with the gloved hand.

08-15-0100

DOOR WARNING REFLECTIVE

Four (4) 6" white reflective stripes shall be installed on the lowest portion of the inner door panels, one (1) on each door.

08-20-0005

ENGINE TUNNEL LIGHT

A Trucklite 4" diameter clear work light shall be provided and installed under the engine tunnel.

08-21-0005

ENGINE COVER

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The fixed type engine cover shall be a maximum of 23.0" high x 41.5" wide. The back of the tunnel shall be 51.0" from the back wall.

The cover shall be an integral part of the cab and made of 0.13" thick aluminum. The interior cab side shall be covered with a multi-layer mat consisting of sound absorbing closed-cell foam, a 1.6 lbs per sq ft sound barrier with a pebble grain finish and held in place by adhesive and cornering trim. The engine side of the cover shall be heavily insulated with multi-layer insulating materials consisting of foam, a 1.0 lbs per sq ft sound barrier with a facing that resists heat transfer, and held in place by adhesive, aluminum stick pins and retention caps.

The cover shall be equipped with a hinged access door to permit routine engine fluid checks without the need of tilting the cab.

The cover shall incorporate the integral rocker switch console.

The cover shall incorporate a latching electrical component access cover to allow complete access to the underside of the switch panel assembly and electrical harness and components.

08-50-0027

REAR FACING OUTBOARD SEATS

Two (2) outboard rear facing crew area Seats Inc. 911 "Universal" SCBA high back individual seats shall be installed in the rear of the cab.

Each "Universal" high back seat shall include a tapered and padded seat cushion and back.

Each seat back shall include a vertically split hinged headrest and ZICO "ULL" bracket with LLS strap. A removable padded vinyl cover shall be supplied over the SCBA cavity.

The seats shall be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The female seat belt clasp shall extend up from the seat base ~ 14" to be within easy reach of the occupant. The ABTS feature is an engineering break through where the passenger restraint harness is built into the seat module and meets the twenty "G" load test.

08-30-0007

SEATBELT WARNING SYSTEM

A seatbelt use warning system shall be installed in the chassis. The system will provide a visual and audible warning when all of the following conditions are met.

1.) Any seat is occupied (sixty pounds minimum).
2.) The corresponding seat belt(s) remains unfastened.
3.) The park brake is released.

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Once activated, the visual and audible indicators will remain active until all occupied seats have the seat belts fastened.

08-30-0008

DRIVER SEAT

The driver's seat shall be a two-way mechanical Seats Inc. 911 "Universal" high back seat and shall include a tapered and padded seat cushion and back, with a minimum of 37" from the seat H-point to the headliner.

The seat shall be equipped with an adjustable lumbar support, adjustable titling seat back and "knee rack" bottom cushion adjustment.

The seat shall be equipped with a red three-point shoulder harness with lap belt and an automatic retractor attached to the cab.

08-40-0021

OFFICER SEAT

The officer's seat shall be a Seats Inc. 911 "Universal" SCBA high back seat and shall include a tapered and padded seat cushion and back.

The seat back shall include a vertically split hinged headrest and ZICO "ULL" bracket with LLS strap. A removable padded vinyl cover shall be supplied over the SCBA cavity.

The seat shall be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The female seat belt clasp shall extend up from the seat base ~ 14" to be within easy reach of the occupant. The ABTS feature is an engineering break through where the passenger restraint harness is built into the seat module and meets the twenty "G" load test.

08-60-0009

FABRIC COVERED SEATS - DURABLE BALLISTIC POLYESTER

The seats shall be covered with a high strength, wear resistant fabric of durable ballistic polyester. A PVC coating is bonded to the back side of the material to help protect the seat cushions from UV rays and from being saturated or contaminated by fluids.

08-60-0030

GRAY SEAT COLOR

All seats supplied on the chassis shall be gray in color.

08-80-0005

CAB MIRRORS

Two (2) Retrac, West Coast style mirrors shall be installed on the front doors of the cab. The upper flat mirror head model 1158E shall be 16" high x 6" wide and lower convex mirror head model 980-4 shall be 8" in diameter. The mirror heads shall be mounted on stainless steel bow

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swing away type arms, center mounted to produce less vibration.

09-00-0005

ELECTRICAL SYSTEM

A single start electrical system shall be installed.

The electrical system shall be 12 volt, suppressed per SAE J551 with three (3) Douglas BCI-31 950 CCA batteries with 210 minute reserve capacity and 3/0 welding type dual path starter cables per SAE J541.

Wiring shall be appropriate gauge with 311 degree F insulation. All wires in the chassis shall be circuit numbered and function coded in addition the SAE wires shall be color coded. The complete wiring harness shall be protected by 275 degree F minimum high temperature flame retardant loom and VN-400S nylon fire retardant.

The following shall be supplied:
One (1) Cole-Hersee #EX26654A ignition switch.
One (1) Cole-Hersee #2484 master battery switch.
One (1) starter button.
Rocker type headlight switch with instrument lamp slide dimmer.
Windshield wiper switch, multiple speed intermittent with integral washer switch.
Self-canceling steering column mounted turn signal switch with integral hazard and head lamp dimmer switch.
Twelve (12) LED backlit rocker switches and legends for accessories.
Master rocker switch, installed below eye level to the right of the instrument panel.

The interior lighting includes:
9.65" long x 4.80" wide flush mount combination red/clear dome lamps over front and rear doorsteps (clear lamp is door activated and individually switched).
4.5" long x 2.5" wide x 1.75" high red flashing open door lamp overhead center.

09-05-0010

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. The gauges shall be backlit with red LED lamps. All gauges shall be driven by stepper motor movements. The instrumentation system shall be multiplexed and shall receive engine and transmission information over the J1587 data bus to reduce the number of redundant sensors.

The instrument panel shall contain the following gauges:

One (1) electronic tachometer with integral digital hour meter. The scale on the tachometer shall read from 0 to 3000 RPM. The hourmeter shall display engine hours of operation.

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One (1) electronic speedometer with integral digital odometer/tripodometer. The speedometer shall have a dual scale with miles per hour (MPH) as the dominant scale and kilometers per hour (KPH) on the minor scale. The speedometer scale shall read from 5 to 85 MPH (5 to 140 KPH). The odometer shall display miles.

One (1) three function gauge with primary air pressure, secondary air pressure and fuel level. The scale on the air pressure gauges shall read from 0 to 140 pounds per square inch (PSI). The air pressure scales shall be non-linear to expand the scales in the region of normal operation. The scale on the fuel level gauge shall read from empty to full.

One (1) four function gauge with engine oil pressure, coolant temperature, transmission oil temperature and a voltmeter. The scale on the engine oil pressure gauge shall read from 0 to 140 pounds per square inch (PSI). The engine oil pressure scale shall be non-linear expand the scale in the region of normal operation. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The scale on the transmission oil temperature gauge shall read from 100 to 300 degrees Fahrenheit (F). The scale on the voltmeter shall read from 8 to 16 volts.

The instrument panel shall contain an Annunciator Module that contains the following indicator lights. All indicator lights shall contain LED lamps.

RED LAMPS
Stop Engine - indicates critical engine fault.
Park Brake - indicates park brake is set.
Low Fuel - indicates low fuel.
Cab Ajar - indicates tilt cab is not locked down. (1)
Volts - indicates high or low system voltage.
Low Oil Level - indicates low engine oil pressure.
High Coolant Temp - indicates excessive engine coolant temperature.
High Trans Temp - indicates excessive transmission oil temperature.
Low Air - indicates low air pressure in either system one or system two.
Low Coolant Level - indicates low engine coolant level. (1)
Low Oil Level - indicates low engine oil level. (1)
Air Filter - indicates excessive engine air intake restriction.

YELLOW LAMPS
Check Engine - indicates non-critical engine fault.
Check Trans - indicates transmission fault.
Wait to Start - indicates active engine air preheat cycle. (2)
ABS - indicates anti-lock brake system fault.
Water in Fuel - indicates presence of water in fuel filter. (1)
Engine Maint - indicates engine maintenance is required. (1)

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GREEN LAMPS
Left and Right turn signal indicators.
Aux Brake Active - indicates secondary braking device is active. (1)
High Idle - indicates engine high idle is active. (1)
Low Trac - indicates low wheel traction for automatic traction control (ATC) equipped vehicles, also indicates mud/snow mode is active for ATC system. (1)

BLUE LAMP
High beam indicator.

The instrumentation system shall provide a constant audible alarm for the following situations:
Low air pressure.
Low engine oil pressure.
High engine coolant temperature.
High transmission oil temperature.
Low coolant level. (1)
High or low system voltage
Critical engine fault (Stop Engine).

The instrumentation system shall provide a three second alarm every three minutes for the following situations:
Low fuel.
Water in fuel. (1)

(1) Feature only available when optionally equipped.
(2) Feature only available on engines with preheat capability.

09-30-0006

HEADLIGHTS - QUAD

Four (4) rectangular halogen headlamps with separate high and low beams in bright bezels shall be provided. The headlamps shall be equipped with a "Daytime Running" light feature, which shall illuminate the headlights to 80% brilliance when the ignition switch is in the "On" position and the parking brake is released.

Two (2) outboard amber turn signals shall be mounted in matching bezels located above the headlamps.

Two (2) round side turn signal/marker lights shall be provided on the front cab corners.

09-31-0006

MARKER LAMPS

Five (5) I..C.C. DOT approved Weldon model #9186-1500-20 Light Emitting Diode (LED) cab marker lamps shall be installed on the face of the cab above the windshield.

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09-35-0006

INTERIOR LIGHTING

The cab interior lighting shall consist of the following:

A red/white dome lamp shall be located over each door. The white lamp shall be activated by its respective door when opened and both activated by an individual switch on the light.

A red/white dome lamp with individual switches shall be located in the headliner, over the engine tunnel to serve as a tunnel surface light.

09-35-0020

FLASHING DOOR AJAR LIGHT

A red flashing door ajar light shall be located in the headliner, centered in the cab. The light shall be 6.00" long x 2.50" wide x 1.75" high and labeled "Do Not Move Apparatus". The light shall be wired to indicate an open door on the cab when the parking brake is released.

09-40-0005

ALTERNATOR

A 270 amp Leece Neville 12 volt alternator model #4864JB with integral regulator and #10 screw AC terminals shall be installed.

09-60-0020

BATTERY JUMPER STUDS

Battery jumper studs shall be provided under the driver's battery box. The studs allow the vehicle to be jump started or cab to be raised in an emergency due to battery failure.

11-00-0005

INTERIOR TEXTURE FINISH

The interior metal surfaces of the cab shall be painted with a Zolatone gray texture finish.

11-20-0005

PAINT FRAME AND CHASSIS UNDER CARRIAGE

The chassis under carriage consisting of frame, axles, driveline running gear, battery boxes, air tanks and other assorted chassis mounted components shall be painted with standard black paint. Paint shall be applied before airlines and electrical wiring is installed.

11-21-0005

EXTERIOR PAINT

All cab painting must be completed prior to the installation of glass accessories or any other cab trim to assure complete paint coverage and maximum corrosion protection.

The entire cab must be disc ground to remove any surface oxidation or surface debris that may hinder the paint adhesion. After the surface is machine finished a high quality acid etching base

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primer shall be applied. Upon the application of required body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The entire cab then shall be coated with an intermediate solids or epoxy surfacer that is designed to fill minor surface defects, provide an adhesive bond between the primer and the paint, and improve the color and gloss retention of the color coats.

The cab shall be finish sanded with 360 grit paper, seams sealed with SEM seal sealer and painted with two (2) to four (4) coats of an acrylic urethane type system designed not only for color retention, but to resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene.

The maximum overall film thickness of the top coat shall not exceed five (5) mils.

The Spartan Chassis, Inc. standard PPG (DBHS or DCC), Sikkens FLNA or Dupont Imron (5000 or 6000) paint shall be warranted for seven (7) years against cracking, checking or peeling and loss of gloss caused by chalking or fading.

Cab underside and doors shall be rustproofed with a ten (10) year or 100,000 mile warranty certificate against perforation issued in the Fire Department's name.

Paint brand and color:

11-23-0005

HAND SAND AND BUFF FINISH

The base coat clear coat finish shall be power sanded and machine finished to achieve a flat finish on all "A" visual surfaces.

12-00-0005

FIRE EXTINGUISHER

A 2.5 pound BC D.O.T approved fire extinguisher shall be shipped loose with the cab.

13-00-0005

ONE YEAR CHASSIS WARRANTY

The chassis manufacturer shall warrant to the original purchaser the custom fire truck chassis for a period of twelve (12) months with the exception of the actual fire apparatus chassis frame which carries a lifetime warranty. The warranty period shall begin on the date the vehicle is delivered to the original purchaser. The warranty may include conditional items, which shall be listed in the detailed warranty document that shall be provided upon request.

13-01-0005

CAB WARRANTY

The cab shall be warranted for a period of ten (10) years. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

14-00-0005

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1500 Challenger Top CAFS Pumper

CH006

OPERATORS MANUAL AND PARTS LIST

A chassis operator's manual and parts list with wiring and air plumbing diagrams shall be provided. The wiring and plumbing diagrams shall be of the chassis model.

14-01-0005

ENGINE AND TRANSMISSION OPERATION MANUAL(S) - One (1)

One (1) engine operation and maintenance manual(s) and one (1) transmission operation manual(s) shall be included in the Spartan operator's manual(s).

30-00-0001

CAB CRASH TEST ECE-29

Spartan Chassis, Inc has successfully submitted their extruded flat floor cab to the International crash test ECE-29, Addendum 28, revision 1. As part of the ECE regulation 29 test, the frontal area of the cab is struck by a 3,700 pound pendulum weight. The weight is brought back to a sixty degree angle and then the weight is released and allowed to swing forward, imparting some 32,600 lb.ft. of force to the cab front face. The cab must be so constructed that after the test, there shall be minimal intrusion of cab structure into the passenger area. Note: After the test the Spartan cab doors remained usable for both entry or exit. Also, as part of the test the cab roof must withstand a static load bearing test. The Spartan cab withstood a weight of over 21,500 pounds without permanent damage or collapse. The above tests were witnessed by and attested to by an independent third party. The test results were recorded on/by cameras, high speed imagers, accelerometers and strain gauges. Notarized copies of the letters verifying the test results and videos of said test are available upon request.

07-00-0000

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1500 Challenger Top CAFS Pumper

CH006

CHASSIS MODIFICATIONS

07-00-1000

CHASSIS MODIFICATIONS

The following modifications and installations shall be performed on the chassis upon delivery to the apparatus manufacturer:

07-14-2200

FRONT BUMPER GRAVEL PAN

A bright aluminum, 1/8" treadplate gravel pan shall be installed between the extended front bumper and the front of the chassis cab. The gravel pan shall extend down over the ends of the bumper area to form a boxed in design.

07-24-6200

CHASSIS AIR HORNS

The chassis provided air horns shall be relocated and recess mounted in the front bumper, one each side.

07-30-0500

MASTER BATTERY SWITCH (Chassis Provided)

A master battery switch shall be provided as detailed in the chassis specifications.

07-30-4500

BATTERY CHARGING RECEPTACLE

A 12V receptacle for charging the vehicle batteries from an external battery charger shall be provided and wired to the batteries. A polarized mating plug shall be included.

The receptacle shall be located below the driver door area.

07-52-1000

FRONT MUDFLAPS

Two (2) black hard rubber mudflaps shall be installed behind the front wheels, one each side.

07-52-2000

REAR MUDFLAPS

Two (2) black hard rubber mudflaps shall be installed behind the rear wheels, one each side. The apparatus manufacturer's logo shall be on each rear mudflap.

07-80-0200

CHASSIS EXHAUST

The chassis exhaust pipe shall discharge at the front of the right rear wheels and shall be pointed downward. A heat shield shall be provided between the pipe and the bottom of the body compartment.

07-90-0500

BACK-UP ALARM

One (1) electronic back up alarm shall be provided at the rear of the apparatus. The alarm shall sound when the transmission is placed in reverse.

07-95-0500

IDENTIFICATION DATA PLATE

An identification plate shall be installed in the driver's area of the cab, specifying the quantity and types of fluids used in the vehicle (as applicable):

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--- Engine oil
--- Engine coolant
--- Chassis transmission fluid
--- Pump transmission lubrication fluid
--- Pump primer fluid
--- Drive axle lubrication fluid
--- Air conditioning refrigerant
--- Air conditioning lubrication oil
--- Power steering fluid
--- Cab tilt mechanism fluid
--- Transfer case fluid
--- Equipment rack fluid
--- Air compressor system lubricant
--- Generator system lubricant

The ID plate shall also include the following:

1.) Build Date
2.) Delivery Date
3.) Paint Information
4.) VIN Number

07-95-2000

OCCUPANT PLATE

An identification plate shall be installed in the driver's area of the cab, specifying the quantity of personnel allowed to ride in the apparatus.

07-95-4000

TRAVEL HEIGHT AND GVWR LABEL

A "high visibility" plate shall be permanently mounted in the cab, visible to driver when seated.

The plate shall show the overall height of the completed apparatus in feet and inches (or meters), the overall length of the completed apparatus in feet and inches (or meters).

The plate shall also show the gross vehicle weight rating (GVWR) in pounds or kilograms.

Text shall also be supplied on the plate, indicating that the information shown is current upon completion of the apparatus. If the overall height of the apparatus changes after the apparatus is put into service, then the purchaser must revise the dimensions on the plate.

09-00-0050

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PUMP, MODULE, AND RELATED ITEMS

09-03-1000

NFPA 1901 COMPLIANT PUMP

The fire pump and related plumbing on the specified apparatus shall be installed in accordance with applicable NFPA 1901 guidelines at the time the contract was placed.

17-00-2000

TOP DESIGN PUMP OPERATOR'S PANEL & MODULE

17-11-1200

TOP PANEL MODULE

A pump operator's top control pump module shall be provided. It shall be assembled and mounted independently from both the chassis and the body to allow sufficient flexing and prevent component fatigue.

A top operator's control surface, the width of the module and at an approximate 45 degree upward slope, shall be provided at the front of the module.

The module shall be constructed using aluminum square tubing . The welded ends of the tubing shall be chamfered prior to welding and shall be ground smooth prior to finishing.

The exterior module shall be sanded, prepped, and primed using paint manufacturer's recommendations. The module structure shall be finish painted to match the body and chassis cab.

A heavy duty 1/4 inch thick rubber isolation material shall be provided between the module frame and the powder coated steel support structure.

FRONT ACCESS

There shall be a removable aluminum treadplate panel across the front of the module, below the operator's area. The panel shall be held in place along a bottom slotted area and a D-ring type latch near the top.

17-18-1000

WALKWAY

An aluminum treadplate walkway shall be provided at the front of the top operator's module and shall be approximately 22"deep. The walkway shall be transverse, with access from either side of shall the apparatus.

Aluminum treadplate steps and spacing shall be compliant with US NFPA recommendations, current at the time of proposal. Treadplate steps shall be provided on either side of the walkway for access to the top of the walkway.

GRAB RAILS

Two (2) compliant grab rails shall be provided, one each side of the module, for access onto the walkway area.

17-20-4100

TOP OPERATED PUMP PANEL (WRAP AROUND)

The pump operator's control panel shall be a top console operated panel, with the operator facing the rear of the apparatus when using the controls.

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The operator's control surface shall be ergonomically designed in a curved "wrap around" fashion to allow quick and easy access to vital controls. The ends shall be curved inward, toward the operator. Due to the additional safety and ease of control access, there shall be **no exception** to this requirement.

PANELS

The operator's control panel shall be recessed. It shall be the width of the pump module and only as deep as the controls and gauges deem necessary.

Side panels shall be provided on each side of the module.

DRAINS AND TRIM RINGS

All side suction and discharge ports shall be fitted with removable polished stainless steel trim rings.

Drains shall be located each side of the module.

GAUGES AND CONTROLS

All valve controls shall be in one line and have chrome levers using positive direct linkages to the valves (unless electrically controlled valves are specified or required). All valves shall be self locking type. The centerline of any control shall not exceed 72" from the base of the operator's standing position.

Discharge gauges shall be located directly above the respective lever control for ease of identification. Gauge height shall not exceed 84" from the base of the operator's standing position.

All gauges shall be functionally grouped to allow easy identification.

17-20-8200

TOP OPERATORS PANELS

The top pump operator's control and gauge panels shall be constructed of removable black vinyl clad aluminum sheet.

17-35-2000

COLOR CODED LABELS

A set of color coded and function described labels shall be provided on the apparatus for the pump operator's controls, gated inlets, discharge outlets, drains, and pressure gauges (as applicable). The labels shall be a high quality plastic material with a durable adhesive on the back.

17-22-1000

SIDE PANELS

The pump compartment top console module shall have left and right side pump panels installed. The panels shall be constructed of black vinyl clad aluminum sheets. The side pump panels shall be removable.

17-30-3200

ACCESS PANELS - BLACK VINYL

There shall be hinged upper access panels provided above the main pump panel, one each side of the pump module. Each shall be black vinyl clad aluminum. Each shall be vertically hinged and shall have two latches.

17-32-0500

PUMP PANEL LIGHT SHIELD - TOP

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One (1) bright aluminum treadplate light shield assembly shall be provided along the full width of the top mount operator's panel. There shall be a 42" long strip light assembly installed under the shield, containing a minimum of four (4) halogen bulbs within the light strip.

A separate switch on the operator's panel shall be provided to activate the lights.

17-32-2200

PUMP COMPARTMENT LIGHTS

Two (2) 5" round dome style lights shall be provided inside the pump compartment area. Each shall be switched on the light itself. The lights shall have a minimum 20 candlepower.

17-32-2300

WALKWAY STEP LIGHTS

Two (2) step lights with noncorrosive rubber shock mounting shall be furnished and shall be located, one each side at the walkway behind the cab to illuminate respective stepping surfaces.

The lights shall be activated with a switch located in the cab.

17-32-3500

RUNNING BOARDS

Running boards shall be installed on each side of the pump compartment module. The running boards shall be constructed of 1/8" embossed fire apparatus bright aluminum treadplate. Each shall be a minimum of approximately 11" deep x the full width of the top console module. The running boards shall have a 1-1/4" upward bend on the inside edge to act as a kick plate.

The aluminum treadplate shall meet recommendations for slip resistant surfaces.

The running boards shall be attached to a frame mounted outrigger support structure. Each running board shall have a 3" downward bend on the front and side faces with a 1" underside return for superior strength.

17-34-4500

TOOL COMPARTMENTS

One (1) tool compartment(s) shall be provided on each side of the area below the walkway. Each compartment shall be furnished with a bright aluminum treadplate door, two (2) push button latches, and a light in each compartment.

10-41-5515

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1500 Challenger Top CAFS Pumper

CH006

SINGLE STAGE FIRE PUMP (CAFS)

The pump shall be a Darley LDMBC single stage fire pump, capable of a 1500 gpm rating.

Power to drive the pump shall be provided by the same engine used to propel the apparatus. The pump shall be midship mounted and designed to operate through an integral transmission, including a means for power selectivity to the driving axle or to the fire pump.

The pump casing shall be a fine grain cast iron alloy, vertically split, with a minimum 30,000 PSI tensile strength and bronze fitted.

The pump shall contain a cored heating jacket feature that, if selected, can be connected into the vehicle antifreeze system to protect the pump from freezing in cold climates.

The impeller shall be a high strength bronze alloy of mixed flow design, accurately balanced and splined to the pump shaft for precision fit and durability. The impeller shall feature a double suction inlet design with opposed volute cutwaters to minimize radial thrust.

The seal rings shall be renewable, double labyrinth, wrap around bronze type.

The pump shaft shall be precision ground stainless steel with long wearing titanium hard coating under the packing glands. The shaft shall be splined to receive broached impeller hubs, for greater resistance to wear, torsional vibration, and torque imposed by engine.

A stuffing box shall be provided and shall be of the plunger injection style, utilizing a plastallic composite packing equalizing pressure around the shaft. Packing shall be renewed by removing the plunger, inserting the packing, and reinstalling the plunger. This packing design shall be provided to minimize friction, heat generation, and apparatus down time. This feature is designed to allow replacement and/or adjustment of packing within a 15-minute time period.

Due to the advantages of the above packing feature, rope or braid type packing gland designs are not acceptable.

The bearings provided shall be heavy duty, deep groove, radial type ball bearings. They shall be oversized for extended life. The bearings shall be protected at all openings from road dirt and water splash with oil seals and water slingers.

The transmission case shall be heavy-duty cast iron alloy with adequate oil reserve capacity for low operating temperatures. The transmission case shall contain a magnetic drain plug for draining the gearcase oil and a dipstick for checking and filling the level of the gear case through its opening. The transmission shall also allow the use of an external heat exchanger for increased cooling under extreme conditions.

The pump driveshaft shall be precision ground, heat-treated alloy steel, with a minimum 2-1/2" x 10" splined ends. Gears shall be helical design, and shall be precision cut for quiet operation and extended life. The gears shall be cut from high strength alloy steel, heat-treated and gas nitrided. The gear face shall be 3-1/2" minimum.

The gearshift shall be a heat-treated alloy steel splined spur gear to engage either the pump drive gear or the truck drive shaft gear. The gear ratio of the pump shall be selected by the pump and apparatus manufacturer's Engineering Department.

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Due to the advantages of the above gear and drive feature, chain drive and designs requiring additional lubrication are not acceptable.

A discharge manifold, as supplied as part of the pump by the pump manufacturer, shall include a discharge check valve assembly to allow priming of the pump from draft with discharges open and caps off.

Due to the importance of the above discharge manifold and check valve assembly, intended to be included with the overall pump design, there shall be no exception allowed to this requirement.

Discharge outlets shall have extensions with companion flange openings to allow ease of service. Two ports shall be provided on a pump panel for testing of vacuum and pressure readings. A weather resistant Performance Data Plate shall be installed on a pump panel.

The pump priming system, heat exchanger system, discharge and suction valves, relief valves, pump shift, and master drain shall be as detailed elsewhere in these specifications.

Two (2) manuals covering the fire pump, pump transmission, and selected options of the fire pump shall be provided with the apparatus.

CAFS COMPATIBLE

The pump transmission shall be designed to accommodate an integrated, air compressor mounting bracket. This bracket shall be installed to properly align a rotary screw air compressor with an external sprocket driven by the pump transmission. The air compressor shall be driven using a Gates "Poly Chain GT" belt drive system. The air compressor drive sprocket shall be supplied with an electric over air, multi plate, industrial clutch designed to be engaged at idle and allow disengagement at any rpm. The clutch shall incorporate an automatic, high CAFS oil temperature shut down to avoid damage to the rotary screw air compressor. An interlock shall be installed to disallow air compressor engagement if engine rpm is higher than recommended.

10-90-1500

U.L. CERTIFICATION - 1500 GPM

The fire pump shall meet and perform the following tests to receive a U.L. Certification.

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

11-00-1200

PUMP SHIFT

One (1) electric over air powered pump shift shall be installed in the cab under the dash. The shift shall engage the fire pump. The apparatus pump shift shall be engaged only when apparatus is in a stationary position and the parking brake is engaged. The following indicator lights shall be included with pump shift.

A green indicator light labeled "**PUMP ENGAGED**" shall indicate pump shift has successfully been completed.

A green indicator light labeled "**OK TO PUMP**", shall indicate the chassis transmission is in pump gear and parking brake is engaged.

10-44-3000

PUMP ANODES

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The pump shall be supplied with two (2) anodes for corrosion protection. The anodes shall be mounted at a 3/4" tap location on the pump manifolds. One (1) anode shall be mounted on the suction side of the pump and one (1) anode on the discharge side of the pump.

10-48-5700

TRANSMISSION LOCK-UP DEVICE

The automatic chassis transmission shall be delivered to the body builder with high gear lock up device installed on the automatic transmission, to allow proper gear ratio for pump operation. The transmission shall be programmed by the chassis manufacturer to include this feature.

10-49-0100

DRIVELINE MODIFICATION

The chassis driveline shall be modified to accommodate any changes required by the installation of the fire pump.

11-00-0000

PUMP OPERATION VIDEOTAPE

One (1) VHS videotape explaining proper fire pump operating procedures and maintenance for the fire pump shall be included upon delivery. This videotape shall be produced and provided by the same company that manufactures the fire apparatus.

11-00-5200

AIR COMPRESSOR SHIFT

An electric powered (CAFS) air compressor shift shall be installed on the pump operator's panel to engage the CAFS air compressor. The switch shall include a green; "air compressor engaged" indicator light located on the operators pump panel.

11-01-2000

ELECTRIC PRIMER (FLUIDLESS)

The fire pump priming system shall consist of one (1) 12V positive displacement type rotary vane primer of a fluidless design.

A single, push-pull control shall be located on the pump operator's panel with a "Pull to Prime - Push To Close" label. The primer shall not require a lubrication tank. The priming pump shall be constructed of heat treated aluminum and hard coat anodized.

11-01-2800

The pump priming system shall include a light to indicate when the pump priming system has been activated. The light shall be red in color and shall be labeled "WARNING - Primer Engaged".

17-64-5200

PRESSURE GOVERNOR

A Darley "***AUTO CONTROL***" electronic pressure governor and engine monitoring system shall be installed on the pump operators control panel. The governor shall be configured to operate with the chassis engine.

It shall regulate engine RPM to maintain a consistent pressure out of the water pump over a wide range of outgoing flows.

The unit shall operate in both RPM and PSI modes. The 6-1/2" x 7-1/2" control unit shall include the following features:

<u>DISPLAY</u>:

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--A 4-digit LED readout for pump discharge pressure.

--A 4-digit LED readout for pump intake pressure.

--A 20 segment LED bar graph for the pressure or RPM setting.

--A 4-digit readout for engine RPMs.

--Three (3), 10 segment bar graphs for battery voltage, engine oil pressure, and engine temperature. The bar graph display shall flash if low voltage, low oil pressure, or high engine temperature condition occurs.

--"Throttle Ready" green LED.

FUNCTION SWITCHES:

Idle Mode - Preset - Increase - Decrease - Silence.

This system shall utilize information from the chassis engine ECU.

An audible alarm buzzer shall be included.

11-00-4400

INDICATOR LIGHT

A green indicator light labeled "**THROTTLE READY**" shall be included with the pressure governor control located on the pump operator's panel. It shall indicate that the pump is engaged in the proper stationary pumping position, and that the parking brake is set.

11-02-4000

INTAKE RELIEF VALVE

One (1) bronze, Elkhart intake relief valve shall be provided and mounted on the suction side of the pump, adjustable from 50-250 psi, on the valve itself. The valve shall be factory preset at approximately 125 psi. The system does not include an on/off control.

11-04-1000

HEAT EXCHANGER & HEATED PUMP CORE

An automatic heat exchanger system shall be provided in the pump. Antifreeze from the vehicle engine shall flow through the pump core jacket. Water flow from the fire pump shall be used to cool the engine antifreeze. This feature shall assist against the pump freezing in cold climates.

11-11-1000

MASTER DRAIN

One (1) rotary style master drain shall be installed on the lower portion of the side control panel. It shall be of brass construction and use a rotary screw mechanism against a rubber sealing surface. Each port shall be isolated. An "open and closed" label with arrows indicating direction shall be installed.

11-11-5000

1/4 TURN DRAINS

Each gated 1-1/2" or larger inlet and discharge shall have a quarter turn drain valve installed. The drain valves shall be located along the bottom on each pump panel. Inlets & discharges shall be plumbed to each drain at the lowest point. Each drain shall be plumbed with low pressure hose to drain below bottom of the apparatus and be directed away from the pump operator. Each drain valve shall have a T-handle control with a recess in the "T" for a color coded function label.

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CH006

12-01-6000

SUCTION INLETS

12-03-8000

6" LEFT SIDE INLET

One (1) 6" suction steamer inlet with male NH threads shall be provided, on the left side pump panel. The inlet shall have a removable screen.

12-04-2000

INLET CAPS

The inlet shall have a polished chrome cap, engraved with the pump manufacturer's logo and name. The logo and name shall be painted with a high quality urethane paint.

12-03-8600

6" RIGHT SIDE INLET

One (1) 6" suction steamer inlet with male NH threads shall be provided, on the right side pump panel. The inlet shall have a removable screen.

12-04-2000

INLET CAPS

The inlet shall have a polished chrome cap, engraved with the pump manufacturer's logo and name. The logo and name shall be painted with a high quality urethane paint.

17-35-1000

PUMP PANEL ID PLATE

An identification plate, prepared by the fire pump manufacturer, shall be installed on the pump operator control panel to identify the fire pump serial number, model number, and performance.

17-35-1200

WARNING - PUMP OPERATOR

A warning plate shall be installed on the pump operator's panel, that states the following:

WARNING: Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations.

11-10-1000

PLUMBING SYSTEM

The plumbing system shall consist of hard piping, or flexible high pressure hose with stainless steel ends, as deemed necessary for the application. Upon completion, the entire system shall be fully pressure tested.

The plumbing and valve arrangement shall be capable of delivering water to the pump at a minimum flow rate of 500 GPM while pumping at 150 psi pressure.

Each gated intake shall be equipped with a 3/4 inch bleeder valve located in close proximity to the intake. All intakes shall be provided with suitable closures (valves or caps) capable of withstanding 500 PSI.

When any 3" or larger intake or discharge is gated (except tank to pump valve), the valve shall have a mechanism to allow the valve to fully open or fully close no faster than 3 seconds.

Any 2-1/2" or larger discharge outlet, mounted 42" or higher from ground, which hose is to be connected, and which is not in a hose storage area, shall be supplied with a sweep elbow of at least 30 degrees.

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All 2" and larger intakes and discharges shall be equipped with drains. All drain valves shall be operational without the operator having to get under the apparatus. All drains shall be detailed elsewhere in these specifications.

All discharges and intakes shall terminate with chrome NST adapters, with chrome caps and chains, unless detailed otherwise in these specifications.

12-07-1000

2-1/2" SUCTION(S) - LEFT SIDE (Darley)

One (1) 2-1/2" brass suction valve(s) shall be installed on the left pump panel with the valve body mounted behind the pump panel. The control handle(s) shall be the quarter turn ball type, of the fixed pivot design, and located along side the suction valve.

The suction(s) shall terminate with a 2-1/2" female NST chrome inlet swivel, a chrome male plug, chain, and a brass inlet strainer.

The valve(s) shall be Darley brand with a polished stainless steel ball.

12-18-0600

TANK TO PUMP LINE (ELECTRIC)

One (1) tank to pump line shall be provided for connection between the water tank and the fire pump. The valve shall be a 3" bronze, quarter turn ball type. The valve shall be controlled from the pump operator panel using an open/closed, two position toggle switch with a green indicator light for the closed position, and an amber indicator light for open. The toggle switch shall activate an electric over air solenoid, which actuates an air cylinder changing the position of the valve. The piping shall consist of a 3" stainless steel sweep elbow from the pump to the valve and a 4" stainless steel sweep elbow from the valve to the water tank.

12-19-2000

TANK TO PUMP CHECK VALVE

The Darley fire pump suction inlet manifold shall be provided with an integral tank to pump check valve. The check valve shall is designed to automatically open when drafting from an onboard water tank, and close if the pump suction receives water pressure from an outside source.

13-01-2000

2" TANK FILL

One (1) 2" pump to tank fill line shall be installed with a 2" inline bronze valve. The valve shall be manually controlled and properly labeled at the pump operator's panel.

14-02-1150

220 CFM COMPRESSED AIR FOAM SYSTEM

The apparatus shall be equipped with a the latest, high energy, automatic, compressed air foam system (AutoCAFS II).

Ratings: The fire pump and air compressor shall be sized to provide at least 220 CFM (cubic feet per minute) of compressed air while simultaneously flowing at least 440 GPM (gallons per minute) of water flow. The pressure of the system shall be set at 125 PSI for the duration of this test.

This rating is as outlined with the NFPA recommendation that the water pump shall discharge two gallons of water for every one CFM of compressed air discharge. Fire pumps with UL ratings in excess of 1000 GPM commonly flow near capacity while simultaneously operating the air compressor at full output.

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Components: The air compressor shall be a high quality, industrial rated, modulating, continuous duty, and of rotary screw design. The air compressor shall be mechanically driven by the main pump and shall be so designed as to provide optimum performance at 70% of rated engine RPM. Air compressor drive train shall provide a means to engage and disengage the air compressor as required.

The air compressor system shall include a pressurized oil lubrication system, oil reservoir with receiver/separator elements, oil filter, inlet air filter, and modulating air inlet control. The air compressor shall be provided with a pressure control system to automatically balance air pressure to water pressure. The air compressor air inlet valve shall open and close to provide the air flow desired while maintaining the air system pressure to water pump pressure to within 5 PSI differential. This balancing system is essential for safe operation of a compressed air foam system.

The air compressor lubrication system shall require cooling water to be supplied from the fire pump through a heat exchanger to cool the air compressor oil. The essential water flow to this oil cooler shall be supplied using a self-cleaning, flushed strainer system to ensure a consistent flow of cooling water. The oil temperature shall be thermostatically controlled to remain at a consistent operating temperature within the range from 170° F to 190° F.

AUTO CAFS COMMANDER

Panel Mounted Controls: The air compressor system shall have mounted on the operators control panel an "AutoCAFS Commander" electronic control used to engage and disengage the AutoCAFS air compressor. It includes an On/Off button with engagement light as well as the following features.

<u>Additional Features</u>

-Digital Air Pressure Gauge
-Mode button to switch between RPM readout, Hourmeter, and optional Air flow meter.
-Digital Air Compressor Oil Temperature Reading
-Programmable Engagement Speed Protection
-Automatic Blow Down Pressure Protection
-Programmable OverSpeed Warning with light and flashing message in Info Center
-Programmable High Speed Automatic Disengagement System
-Programmable Over Heat Warning
-Programmable High Temperature Automatic Disengagement System

-Optional "AutoOn" setting. Allows automatic engagement of the AutoCAFS air compressor any time the pump is placed into gear and operated. This feature can be used to eliminate two (2) steps when operating a CAFS when used in conjunction with the FoamPro "AutoOn" feature in the foam proportioner.

CAFS AIR INJECTION - AUTOMATIC

The AutoCAFS II shall utilize automatic air flow switch controls to inject the proper volume of compressed air into the foam discharges. A panel mounted toggle switch control shall automatically regulate the precise amount of compressed air independently into each compressed air foam system discharge of 2" plumbing or less. The air flow amount shall be factory preset to the proper levels. Each foam discharge shall include a manually adjustable valve mounted inside the pump compartment for fine tuning when desired.

The automatic control shall consist of a weatherproof toggle switch which electrically activates an air flow valve sized according to the SCFM requirement of the discharge. Each automatic air flow injection switch, mounted on the panel, shall be installed using a red protective switch cover. Each CAFS air injection switch shall be appropriately labeled.

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AIR OUTLETS 1/4" CAFS SUPPLY

There shall be brass 1/4" female air hose quick-disconnect fittings mounted on each side pump panel. A bulkhead fitting with a removable coupling shall be mounted to the panel to allow for panel serviceability. The fittings shall be connected to the apparatus CAFS air compressor discharge outlet using 3/8" red flexible hose. There shall be an adjustable regulator installed on the discharge side of the air compressor separator to provide clean oil free compressed air to the side panels. Two (2) male quick disconnect fittings shall also be supplied.

STANDARD FOAM SUPPLY VALVE

The foam system shall be installed with a 3-way foam system supply valve. This 3/4" valve functions as a multipurpose valve control. In the standard position, the valve provides foam supplied from the foam tank to the foam proportioner. In the next position, the valve provides a drain using a short rubber hose connected to this valve. In the final position, the valve provides an "Off" position to allow for cleaning of the inline foam concentrate strainer. In this final position, the drain hose can also be utilized as an overboard secondary foam pickup hose.

This alternate source to the foam proportioner shall be provided near the inlet to the foam pump using a 3/4" three way valve to disconnect foam flow from the tank and allow foam to be drawn from a pail or other source through a 3/4" inside diameter yellow hose approximately four feet long. This hose shall be provided near the pump panel on the side of the truck and is intended to work best with the pail of foam concentrate setting on the running board.

This compressed air foam system shall include an air pressure gauge for use with CAFS.

Each of the components of this Automatic Compressed Air Foam System - (air compressor, drive system, foam proportioner, control and instrumentation system) shall be sized, driven, and installed to produce a well operating and reliable CAFS unit.

This (AutoCAFS II) compressed air foam system shall be completely assembled and tested by the fire pump manufacturing facility before delivery. The system shall then be installed by the fire apparatus manufacturer and retested for complete NFPA compliancy.

FOAM OUTLETS

The compressed air foam system shall be plumbed to provide both foam solution and compressed air to the specified discharges. Detailed descriptions of these discharges shall be provided elsewhere in these specifications.

14-14-2000

CAFS IN SERVICE REQUIREMENTS

The bidder shall demonstrate that other "CAFS" (compressed air foam systems), similar to the system proposed, are in service and operating successfully.

A listing of CAFS customers shall be provided with customer names, addresses, phone numbers, contact persons, and in service dates.

14-14-2200

CAFS TESTING - DEMONSTRATION - MANUAL REQUIREMENTS

The compressed air foam system shall be tested and run for a minimum of eight (8) hours prior to delivery. After testing is completed, the foam system and CAFS oil system strainers shall be removed and

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flushed. The system shall then be delivery tested once again to ensure all strainers, fittings, and components are installed properly.

Demonstration for proper operation and maintenance shall be provided for Purchaser's designated personnel at a location mutually agreed upon between the Purchaser and the manufacturer.

Two (2) manuals for the CAFS pumping system shall be provided upon delivery.

14-20-2000

FOAM PROPORTIONER (2001 System)

A FoamPro 2001 Class A automatic, electronic, direct injection, foam proportioning system shall be installed on the discharge side of the pump. It shall provide foam to predetermined foam discharge(s). This foam system is completely automatic and requires only one push button to turn it on before the system is functioning.

The system shall incorporate a paddle wheel flow meter to measure the water flow, and based on the foam percentage selected at the controller the direct injection pump shall inject the proper amount of foam into the foam discharge(s).

The system is capable of providing precise foam solution concentration rates from 0.1% to 3%, and is operator adjustable with the push button digital display control.

System Capacity - Foam Pump is capable of 2.5 gpm of foam output @ 150 psi. Pump motor is 1/2 HP 12 volt.

Foam Concentration.....Water Flow Range

0.1%.....20-2600 gpm
0.2%.....20-1300 gpm
0.3%.....20-833 gpm
0.5%.....20-520 gpm
1.0%.....20-260 gpm
3.0%.....20-85 gpm

A check valve shall be installed between the flowmeter and the injection fitting to avoid foam contamination back into the rest of the pump.

System Features: Four (4) selectable modes for operator information:

1) Flow mode: Displays the total amount of water being flowed out of the foam discharge(s). Foam system need not be enabled to function in this mode.

2) Total Water mode: When selected shows the total amount of water flowed out of the foam discharge(s) since the unit was in operation.

3) Foam Percentage % mode: When selected shows the percentage rate that foam is being injected at if the system was turned on. This percentage can be changed by pressing the up or down arrow buttons at the bottom of the display.

4) Total Foam mode: When selected shows the total amount of foam that has been injected since the unit was turned on.

System shall be provided with a low foam tank level switch which shall alert operator of low foam

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concentrate level and shall automatically shut unit off after two minutes.

Foam system flushing is achieved by simply turning off the unit and flowing water out of the discharge(s) that were previously flowing foam solution.

System shall be completely installed inside pump compartment, with digital control unit and instruction plate mounted on the pump operators control panel. An installation and operation manual shall be included with the system, and a one year warranty shall also be provided. The system shall be installed by a certified FoamPro dealer only, and shall be fully calibrated and tested for proper operation prior to delivery.

15-20-0400

2-1/2" LEFT SIDE DISCHARGES (Darley)

Two (2) 2-1/2" discharge outlets with 2-1/2" pipe and valve with chrome NST threads shall be supplied at the left side panel. Each valve shall be a quarter turn ball type, self locking, fixed pivot design and shall be operated with a lever control from the pump operator's panel.

Each valve shall be Darley bronze valve with a high polished stainless steel ball.

15-50-6150

Each valve shall have a chrome 30 degree elbow, with a chrome cap and a stainless steel retaining chain.

17-42-3300

Two (2) 2-1/2" liquid filled gauges, each with a stainless steel bezel shall be provided, one for each discharge. The gauges shall be located on the pump operator's panel near the respective discharge control.

15-30-0400

2-1/2" RIGHT SIDE DISCHARGES (Darley)

Two (2) 2-1/2" discharge outlets with 2-1/2" pipe and valve with chrome NST threads shall be supplied at the right side panel. Each valve shall be a quarter turn ball type, self locking, fixed pivot design and shall be operated with a lever control from the pump operator's panel.

Each valve shall be Darley bronze valve with a high polished stainless steel ball.

15-50-6150

Each valve shall have a chrome 30 degree elbow, with a chrome cap and a stainless steel retaining chain.

17-42-3300

Two (2) 2-1/2" liquid filled gauges, each with a stainless steel bezel shall be provided, one for each discharge. The gauges shall be located on the pump operator's panel near the respective discharge control.

15-40-2100

2-1/2" LEFT REAR DISCHARGE

One (1) 2-1/2" discharge outlet with 2-1/2" pipe and 2-1/2" self-locking valve and chrome 2-1/2" NST threads shall be supplied at the left rear of the apparatus. The valve shall be bronze with a nylon ball.

The valve shall be a quarter turn ball type, self locking, fixed pivot design and shall be operated with a control from the operator's panel. The valve control shall be mounted to the valve body mounted behind the pump panel.

15-50-6100

The valve shall have a chrome 30 degree elbow, with a chrome cap and a stainless steel retaining chain.

17-42-3200

A 2-1/2" liquid filled gauge with a stainless steel bezel shall be provided for the discharge. The gauge shall be located on the pump operator's panel near the discharge control.

15-50-5000

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1-1/2" FRONT DISCHARGE (CAFS)

One (1) 1-1/2" discharge with 2" pipe and 2" self-locking valve shall be piped to the front bumper of the apparatus. The discharge shall terminate with a 1-1/2", 90 degree swivel with a chrome 1-1/2" NST adapter. The discharge shall be controlled manually at the operator's panel.

The discharge outlet shall be connected to the foam manifold plumbing and be capable of delivering water, foam solution, or CAFS. A CAFS air flow injection control shall be located adjacent to the water discharge control mounted on the operator's control panel.

17-42-3200

A 2-1/2" liquid filled gauge with a stainless steel bezel shall be provided for the discharge. The gauge shall be located on the pump operator's panel near the discharge control.

15-54-1100

DECK GUN DISCHARGE

One (1) 3" deck pipe assembly with a 3" bronze slo-cloz self-locking valve shall be provided above the pump as a discharge for a deck gun. The piping shall terminate with NPT threads.

A manually operated control handle shall be located on the pump operator's control panel.

15-58-1100

One (1) deck gun pipe outlet flange shall be installed on the deck gun piping. It shall be a 4-bolt flange installed for mounting a deck gun.

17-42-3200

A 2-1/2" liquid filled gauge with a stainless steel bezel shall be provided for the discharge. The gauge shall be located on the pump operator's panel near the discharge control.

15-72-4400

SPEEDLAY HOSEBED - WALKWAY (CAFS)

Two (2) speedlays shall be installed on the front portion of the top mount walkway. The speedlays shall be side by side and shall each have capacity for 200 ft. of 1-3/4" double jacket fire hose. The speedlays shall each be piped with 2" pipe and 2" self-locking valve and terminate with a 2" NPT x 1-1/2" NST chicksan type swivel at center of the speedlay. The swivels shall allow hose to play out either side of each speedlay.

The outside edges of each side opening shall be trimmed with polished stainless steel. A manual control shall be furnished at the pump operator's panel for each.

Each speedlay shall be piped, including required check valves and air flow injection control, to provide water, foam, or compressed air foam.

17-42-3300

Two (2) 2-1/2" liquid filled gauges, each with a stainless steel bezel shall be provided, one for each discharge. The gauges shall be located on the pump operator's panel near the respective discharge control.

17-41-7010

WATER LEVEL GAUGE

One (1) Fire Research ***"TankVision"*** water tank level gauge shall be installed on the pump operator's panel. The gauge shall have an LED display, which flashes when the tank level reaches 25% of capacity. A built in calibration system shall allow a bottom tank mounted transducer to be mounted with any tank configuration.

19-00-7100

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WATER TANK, FIRE BODY & RELATED COMPONENTS

BODY CONSTRUCTION

The apparatus body shall be constructed of structural tubing and formed sheetmetal, welded utilizing an A.W.S. Certified welding procedure, for the highest quality of structural stability of the body.

31-10-1000

EXTRUDED ALUMINUM BODY CONSTRUCTION

Aluminum tubular extrusions shall have a wall thicknesses of 1/8 inch and 1/4 inch and shall be used in the construction of the structural body framework. Aluminum extrusions of 6061T-6 and 6063T-52 grade shall be used. This type of construction offers a solid framework for structural integrity for the entire body module.

The compartmentation specified is fabricated with sheetmetal panels. In load bearing areas, structural tubular supports shall be present. Compartment floors shall be "sweep-out" design.

No dissimilar metals shall be used in the body and any substructure support without being separated by a corrosion and electrolysis inhibitor. Bodies utilizing "L-style" brackets bolted to the chassis frame shall not be acceptable.

31-21-3100

BODY STRUCTURE WIDTH

The width of the apparatus body, from the outside of the left side compartments to the outside of the right side compartments shall be 99". This excludes any attached peripherals such as rub rails, fenderettes, grab handles, etc.

31-28-1000

COMPARTMENT CONSTRUCTION

The compartments, including the floors, shall be constructed of the same heavy duty material as used for the body. Divider walls between compartments shall be single wall construction.

Each compartment shall have venting. Upper compartments (if specified) shall vent into the lower compartments. Any lower compartments shall vent into the wheel well area. A high quality foam filter assembly shall be used, and shall be easily removable for cleaning and shall be treated to prevent mildew.

31-28-3000

The compartments shall have a smooth finished interior appearance. This shall be accomplished by overlaying the structural tubular construction with smooth sheet metal panels.

31-31-6100

FENDER PANELS

The body panel in the wheel well area on each side of the body shall be fabricated of the same material as the body and finish painted.

FENDER LINERS

Wheel wells shall have semicircular removable black polymer composite inner liners bolted to the wheel well panel and supported inboard by brackets connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate.

31-40-6100

HOSE BED CONSTRUCTION

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A hosebed shall be provided. The area shall be free of sharp edges to protect the hose when loaded or distributed. The hosebed area of the apparatus shall remain natural finish metal and unpainted or covered. The hose bed walls shall be of the same material as the body. The upper, outer edges shall have a flange type design for strength and stiffness. The hose bed shall be free from all projections, which may interfere with the unloading of hose.

31-44-1000

HOSE BED DIVIDER(S)

One (1) adjustable aluminum hose bed divider(s) shall be provided and installed in extruded tracks to allow adjustment from side to side for alternate hose capacities. The divider(s) shall have an unpainted, "DA" finish, and shall have a radius corner on the rear portion.

31-48-0100

DUNNAGE AREA

A "cross divider" shall be installed at the front of the hosebed, to partition the water tank fill tower from the main hose bed. This shall serve to provide a storage area that apart from the main hosebed. Any mountings for hose bed divider adjustment shall be mounted to this partition.

31-50-3000

FASTENERS

All bolts and nuts used in the finish construction of the apparatus shall be coated stainless steel to help prevent dissimilar metal electrolytic reaction and corrosion. Any bolt extending into a compartment, or into any hose bed area (if present), shall have an acorn nut attached or be protected in such manner where sharp edges are avoided.

31-51-5100

TREADPLATE AND TRIM

All aluminum used in an overlay area shall be bright type 3003, 1/8" thick diamond plate material coated with 3M sealant and adhesive on the back sides to protect and to put an insulating barrier between dissimilar metals to assist in corrosion resistance.

There shall be treadplate as follows:

The areas on top of the body compartments, both sides, extending down over the sides and angled to form a drip rail.

The front faces of the body compartments and the front header of the hosebed.

The entire back of the apparatus body, including both the side compartment and rear compartment back areas.

31-51-5350

The treadplate on top of the body side compartments shall be approved stepping surfaces as recommended by the latest NFPA standards for abrasiveness, at time of bid.

31-62-5100

REAR TAILBOARD WITH GRIP SURFACE

A rear tailboard shall be furnished and shall be approximately fifteen (15) inches deep It shall be bright aluminum treadplate, welded on, and shall be the width of the apparatus rear.

The tailboard shall have an open gripstrut stepping surface bolted in place, covering the width of the tailboard. The extruded stepping surface shall be completely enclosed by the supporting structural framework to minimize damage. The open grip strut material shall be removable with hand tools, if needed.

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A sign: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT" shall be attached.

31-70-0500

RUBRAILS

Rubrails shall be installed using solid black rubber material designed to help protect the lower body and cushion against accidental contact. Each rubrail shall be mounted below the lower side compartments and at the vehicle rear body, next to the rear tailboard. Each end shall have a hard black rubber end cap.

There shall be bright polished scuff strips mounted between the body surface and the rub rails.

31-80-4100

REAR FOLDING STEPS

Six (6) large, heavy duty chrome folding steps shall be furnished and located, three each side, at the apparatus rear. There shall be a barrier material installed between the body surface and the steps.

31-92-1000

REAR VERTICAL HANDRAILS

Two (2) vertically mounted handrails, approximately 30" long, shall be provided, one each side at the apparatus rear. Each shall be 1-1/4" extruded aluminum tubing with rubber grip inserts, mounted in chrome stanchions. There shall be a barrier material installed between the body surface and the handrails.

31-92-4200

HORIZONTAL REAR CROSSRAIL

One (1) horizontal rear crossrail shall be provided at the upper rear portion of the rear body panel. The rail shall be the approximate width of the rear body, between the width of any side comartments. It shall be 1-1/4" extruded aluminum tubing with rubber grip inserts, mounted in chrome stanchions. There shall be a barrier material installed between the body surface and the handrail.

20-10-5200

1000 GALLON TANK - COPOLYMER

The booster tank shall be constructed of a copolymer material and properly baffled.

The tank shall be provided with at least one (1) full length longitudinal baffle and a sufficient number of transverse baffles so that the maximum dimension of any spaces in the tank, either transverse or longitudinal, shall not exceed 46", and not less than 23".

The baffles shall have openings at both the top and bottom to permit movement of air and water between spaces to allow maximum flow requirements. The baffles shall form an integral part of the tank, and design shall be to provide and maintain safe road stability regardless of water level.

The tank shall have a 4" minimum overflow and air vent designed to prevent damage to the tank under high flow conditions and enclosed in front tank fill tower.

The tank fill tower shall extend upward from hose bed the same approximate height as the body sides. The fill tower shall be installed on front corner of the tank in tank top. It shall be of adequate size, minimum 10" X 10", to accommodate overflow and vents, and shall have a hinged cover and screen installed.

The overflow shall be designed and located to avoid water loss on fast stops or starts, and is also to be located not to affect traction of the rear tires.

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The tank outlet connection shall be designed with a 12" anti swirl baffle plate above tank outlet to prevent air from mixing with the water when pumping from the tank.

The tank shall be mounted per the manufacturer's requirements.

The tank shall carry a lifetime warranty provided, per the tank manufacturer.

20-30-8050

The fill tower shall be located in the left front area of the tank.

20-30-9501

TANK OVERFLOW

The fill tower shall have a 4" overflow that shall discharge beneath the tank, behind the rear wheels.

21-10-2000

FOAM TANK

One (1) 25 gallon foam tank shall be provided, integral with the water tank and shall have a rectangular fill tower, approximately 10" x 10", with a hinged cover and a removable screen. A tank drain shall be provided inside the pump compartment.

31-18-1000

ALUMINUM BODY MOUNTING SYSTEM

The complete body shall be mounted to the chassis frame rails with a shock isolation system.

Heavy duty coil style springs shall be incorporated to minimize flexing of the frame rails and transmitting harmful loads and twisting into the structural body components. The quantity of mounts utilized shall correspond directly to the weight being supported.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between the axles. All body to chassis mountings shall be bolted so the body is removable from the chassis.

"U" bolting or hard mounting designs that do not allow for chassis flex shall not be acceptable.

31-19-1650

REAR TOW EYES

Two (2) heavy duty 1" plate steel tow eyes shall be provided beneath the rear tailboard. The tow eyes shall be painted black unless specified otherwise.

31-31-6300

FENDERETTES

Two (2) polished stainless steel fenderettes shall be provided on the body rear wheel well openings, one (1) each side. A rubber welting shall be provided between the body and the fenderettes to provide a seal. A dielectric barrier shall be provided between the fender crown fasteners and the fender sheet metal to prevent corrosion.

31-41-1000

HOSE BED CAPACITY

Unless specified otherwise, the hose bed capacity shall be as recommended by NFPA for this type of apparatus.

31-42-0100

HOSE BED FLOORING

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The hose bed floor shall be constructed of aluminum extrusions. It shall be smooth and free from any obstructions or protrusions which may interfere with the loading or unloading of hose.

34-35-1003

SIDE COMPARTMENTATION

The following compartments shall be supplied on the apparatus:

LEFTCOMPARTMENTS

1.) One (1) compartment ahead of the rear wheels, approximately 46" wide x 65" high x 25" deep lower x 14" deep upper. The door opening shall be aproximately 44" wide x 62" high. The compartment shall have approximately 27 cubic feet of space.

2.) One (1) compartment over the rear wheels, approximately 58" wide x 29" high x 14" deep. The door opening shall measure approximately 56" wide x 27" high. The compartment will have approximately 14 cubic feet of space.

3.) One (1) compartment behind the rear wheels, approximately 46" wide x 65" high x open into the rear compartment lower x 14" deep upper. The door opening shall be approximately 44" wide x 62" high. The compartment shall have approximately 27 cubic feet of space.

RIGHT COMPARTMENTS

4.) One (1) compartment ahead of the rear wheels, approximately 46" wide x 65" high x 25" deep lower x 14" deep upper. The door opening shall be aproximately 44" wide x 62" high. The compartment shall have approximately 27 cubic feet of space.

5.) One (1) compartment over the rear wheels, approximately 58" wide x 29" high x 14" deep. The door opening shall measure approximately 56" wide x 27" high. The compartment will have approximately 14 cubic feet of space.

6.) One (1) compartment behind the rear wheels, approximately 46" wide x 65" high x open into the rear compartment lower x 14" deep upper. The door opening shall be approximately 44" wide x 62" high. The compartment shall have approximately 27 cubic feet of space.

34-36-1100

FULL HEIGHT REAR CENTER COMPARTMENT

7.) One (1) compartment at the rear, as high as possible depending on the water tank height. The compartment shall have a Robinson (ROM) roll up door installed. The door opening shall be approximately 27" wide x as high as possible.

35-19-0200

REAR ROLL UP DOOR FINISH

The rear roll up door shall be in a natural aluminum satin finish.

35-43-0103

BODY DOOR DESIGN

All of the side body compartment doors shall be roll up style doors.

35-90-1200

ROLL UP DOOR CONSTRUCTION

Robinson brand roll-up style doors shall be provided at the specified door locations.

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Each door shall be manufactured in the United States. Replacement parts shall be available within 2-3 working days.

The door slats shall be double wall box frame extrusion. The exterior surface of slat shall be flat and interior surface to be concave to prevent loose equipment from jamming the door. Door slats shall be anodized to prevent oxidation. Door slats to have interlocking end shoes on every slat to be secured by a punch dimple process. The door slats shall have interlocking joints with a folding locking flange. A PVC/vinyl inner seal to prevent any metal to metal contact shall be provided between each slat.

Each track shall be one piece construction with attaching flange and finishing flange incorporated into the design. The flange design eliminates any requirement for additional trim or caulk. Each track shall have a replaceable seal to prevent water and dust from entering the compartment.

Each assembly shall include an aluminum drip rail with a replaceable wiper seal.

Each roll-up door shall have a 4" counterbalance spring in the roller assembly to assist in lifting and help prevent the accidental closing.

A full width lift bar shall secure each door.

35-19-0101

SIDE ROLL UP DOOR FINISH

The side roll up doors shall be in a natural aluminum satin finish.

37-10-3200

LADDER STORAGE RIGHT

A ladder storage compartment shall be provided at the right side of the apparatus between the water tank and the body compartments. It shall be located just below the hose bed level.

Nylon or poly guides shall be provided at the top and bottom of the storage area for the ladders to slide on and be held in position when stored. Appropriate stops shall be provided at the front of the ladders.

Access shall be from the rear of the apparatus. A vertically hinged aluminum treadplate door with latch shall be provided to enclose the ladders at the rear.

In order to provide a comfortable and safe level of access to the ladders, and allow maximum compartmentation, there shall be no exception allowed to this feature.

37-10-4300

The ladder storage compartment shall have capacity for one (1) aluminum 24 ft. two-section extension ladder, and one (1) aluminum 14 foot roof ladder.

37-10-4400

A storage chute shall be provided for one (1) 10 ft. folding attic ladder.

37-10-4600

There shall be two (2) pike pole storage tubes included.

37-20-2000

SUCTION HOSE STORAGE LEFT

A suction hose storage compartment shall be provided at the left side of the apparatus between the water tank and the body compartments. It shall be located just below the hose bed level. Access shall be from the rear of the apparatus.

Two (2) troughs shall be provided in the storage area for the hose to slide on and be held in position when stored. Appropriate stops shall be provided.

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A vertically hinged aluminum treadplate door with latch shall be provided to enclose the hoses at the rear. A switch shall be provided to activate compartment door ajar circut.

In order to provide a comfortable and safe level of access to the hoses, and allow maximum compartmentation, there shall be no exception allowed to this feature.

40-00-0000

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PAINT, STRIPING, AND LETTERING SECTION

40-10-1400

PAINT FINISH

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

All welded metal surfaces shall be ground to a smooth surface prior to the degreasing and high pressure, high temperature phosphatizing process. The entire surface shall the be sprayed with a non chromate sealing compound.

The paint applied to the apparatus shall be PPG Industries Delta brand. A multi step process as formulated by PPG shall be followed, including a minimum ot two top coats and clear coat finish, meeting high performance and resistance requirements. The coatings shall be infra red, baked air dried, and shall provide a full gloss finish.

The products shall have no adverse effects on the health or nor present any unusual hazard to personnel when used according to manufacturers recommendations for handling and proper protective safety equipment, and for its intended use. The materials and processes used shall be as approved by OSHA, an organization that monitors this type of function for safety and health reasons. The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations in force at the time of proposal.

The entire exterior body structure (excluding roll-up doors) shall receive primer coats and finish coats. The apparatus body shall be painted in a down draft type paint booth to reduce dust, dirt or impurities in the finish paint.

40-11-0500

COMPARTMENT FINISH (ZOLATONE)

Each interior compartment shall be coated with gray Zolatone, a polychromatic, modified nitrocellulose coating with a flat background color with accenting fleck colors. Zolatone is V.O.C. Compliant, isocyanate and lead free. The Zolatone finish is washed and waxed like paint, and is resistant to many solvents and wear.

40-11-3050

PAINT COLOR

The apparatus body paint shall be "cross referenced" from the chassis paint, and shall be painted to match the main chassis color as close as possible.

40-25-0200

REFLECTIVE STRIPE

To comply with current NFPA standards, reflective striping shall be applied to the side of the vehicle chassis and body on at least 50% of the overall length of the vehicle. At least 50% of the rear and 25% of the front of the vehicle width shall have reflective striping applied.

Striping shall be 3M CONTROLTAC reflective striping (or equal).

40-25-1000

The stripe shall be a **4"** wide reflective stripe

40-25-2000

The reflective stripe color shall be **WHITE**.

40-25-4000

The reflective stripe shall be applied in a straight line along each side of the apparatus. The height of the stripe from the ground to the center of the stripe shall be per NFPA recommendations.

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50-00-0000

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12 VOLT ELECTRICAL SECTION

50-00-0700

12 VOLT ELECTRICAL SYSTEM (Multiplexing)

MULTIPLEXING

A multiplexed wiring system shall be installed, controlling all electrical functions installed by the apparatus manufacturer. The system shall be driven by "nodes" in key locations around the vehicle.

ELECTRICAL LOAD MANAGEMENT

Electrical Load management shall also be part of this multiplex system, allowing diminished and load shedding capabilities of particular functions.

GENERAL WIRING

Apparatus body wiring shall be high temperature compatible wire, insulated with chemically cross-linked polyethylene and to withstand prolonged temperatures of up to 350 degrees Fahrenheit. The wiring shall be resistant to grease, oil, fluids, and abrasion and shall meet or exceed S.A.E. Certification J1128. It shall be stranded copper alloy conductors of a gauge rated to carry 125% of the maximum current for which the circuit is protected. Wiring not within the multiplexed system shall be individually color coded and function labeled every three (3) inches on the insulation.

All required testing shall be performed before the apparatus is delivered. All required test documents shall be supplied at the time of apparatus delivery.

All wiring for the apparatus shall be installed in accordance with quality electrical standards, protected in loom or conduit. Grommets shall be installed where wire passes through body panels, where applicable.

WIRING DIAGRAMS

Electrical wiring diagrams of the specific apparatus shall be furnished with the completed apparatus.

50-00-2700

12 VOLT SWITCHES

There shall be a rocker switch panel provided in the cab. This switch panel shall control warning lights and 12 volt accessories. The switches shall be rocker style switches. Each switch shall have a pilot light indicating the "on" position. There shall be a main master rocker switch to cut power to all warning light rocker switches. The master switch shall be red in color with a red pilot light. Each switch shall be labeled as to its function.

50-01-0100

RUNNING LIGHTS & REFLECTORS

There shall be running lights and reflectors mounted on the body. Lights shall be recessed in the body or rubrails. They shall be along any running boards, body sides, and rear tailboard. The lights and reflectors shall meet USA Federal Motor Vehicle Safety Standard # 108.

50-01-0800

LICENSE PLATE HOLDER & LIGHT

A license plate light and holder shall be provided on the rear of the apparatus body. The light shall be wired to illuminate with the parking/headlights.

50-01-1000

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MIDSHIP TURN SIGNAL

There shall be a midship turn signal mounted on each side of the apparatus, at the rear wheelwells.

50-02-2000

REAR DIRECTIONALS

Rear directional lighting shall be supplied as follows:

Two (2) Whelen 600 series halogen 6" x 4" stop and tail lights, one each side, red lens.

Two (2) Whelen 600 series halogen 6" x 4" turn signals, one each side, amber lens.

Two (2) Whelen 600 series halogen 6" x 4" back up lights, one each side, clear lens.

50-02-5000

HOUSINGS FOR DIRECTIONALS

Two (2) sets of Whelen rear signal lights shall each be housed in a model #CAST3 cast aluminum bezel, designed to hold three (3) lights each.

50-03-0200

REAR STEP LIGHTS

Two (2) step lights with non-corrosive rubber shock mounting shall be furnished and shall be located, one each side at the apparatus rear to illuminate respective stepping surfaces.

The lights shall be activated with a switch located in the cab.

50-03-0800

FRONT BODY STEP LIGHTS

Two (2) step lights with non-corrosive rubber shock mounting shall be furnished and located, one each side, at the front face of the apparatus body to illuminate the respective stepping surfaces. The lights shall be activated with a switch located in the cab.

50-05-4100

COMPARTMENT LIGHTING

Each body compartment shall contain (1) clear vertical strip light assembly, as provided by ROM. Wide and shallow compartments over a wheel well shall have two strip lights, one on each side of the door.

Each light strip provided shall be full length of the compartment. Strip lighting provides uniform light dispersion throughout the compartment even when shelves are installed. The compartment strip lighting shall be automatically activated whenever a compartment door is opened.

50-05-5100

Each roll up door shall have an integral "door open" indicator magnet in the lift bar. If the bar is not properly closed, it shall activate the "Door Open" light in the cab.

50-05-5500

"DO NOT MOVE APPARATUS" LIGHT

A flashing red light, properly labeled with the words "Warning - Do Not Move Apparatus When Light is On", shall be located in the cab. The light shall be activated automatically when any cab or body compartment door is opened, as long as the chassis parking brake is not engaged.

In addition, accessories such as a ladder rack (or similar storage rack), any extendable light or tower, or a telescoping deck gun device shall also be connected to this ajar circuit, to activate the light when any of these items are not properly nested, and the parking brake is not engaged.

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50-07-0600

CHASSIS CAB GROUND/STEP LIGHTING (With Chassis)

Cab ground lighting shall be supplied with the chassis. Each light shall be controlled by the respective cab door switch. These lights are to be supplied and installed by the custom chassis manufacturer (See chassis specifications).

50-07-1000

UNDER BODY GROUND LIGHTS

Four (4) ground lights shall be provided. Each shall have a clear lens and shall be mounted on brackets, angled outward, beneath the apparatus. The lights shall be wired to activate when the apparatus is in the "park" position.

The lights shall be mounted as follows:

--Two (2) at the pump module running boards, one each side.
--Two (2) at the rear tailboard, one each side.

50-09-1000

UNITY HOSE BED/DECK LIGHTS

Two (2) 6" chrome plated Unity hose bed/deck lights shall be installed at the rear of the apparatus. Each light shall be manually operated and switched at the light.

51-00-1000

WARNING LIGHT SYSTEM

The following warning lights shall be installed in zones, and properly switched.

The upper and lower level zones shall be provided as one certified package by one light manufacturer.

54-00-2000

WHELEN PUMPER WARNING LIGHT SYSTEM (HALOGEN)

54-10-1100

LIGHT BAR

Zone A - (Upper Front) - One (1) Whelen C300700N 72" Centurion light bar system shall be supplied and install. The light bar shall include three (3) 110 RPM rotators, and four (4) "V" mirrors.

Rotators with clear lenses shall be shut down with parking braking for "Blocking Right-Of -Way" mode.

54-20-1000

Light bar shall be mounted on the centered forward section of the cab roof.

54-21-2200

The lens colors shall be as follows:

Driver's Side of Lightbar - **Red**.
Driver's Side Inboard - **Clear**.
Center Section - **Red**.
Officer' Side Inboard - **Clear**.
Officer's Side of Lightbar - **Red**.

54-30-3050

FRONT WARNING

Zone A (Lower Front) - Two (2) Whelen 600 halogen lights shall be mounted, one each side, on the front face of the cab or cab grille.

54-32-1000

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The lens color shall be as follows:

Driver's Side - **Red**, Officer's Side - **Red**

54-40-0650

SIDE WARNING

Zone B (Right Side-Lower) - Three (3) Whelen model 600 halogen lights with chrome bezels shall be supplied and installed. The lights shall be located at the lower front side cab corner, midship area, and rear side corners of the apparatus.

Zone D (Left Side-Lower) - Three (3) Whelen model 600 halogen lights with chrome bezels shall be provided and installed. The lights shall be located at the lower front side cab corner, midship area, and rear side corners of the apparatus.

54-42-1000

The lens color shall be as follows

Driver's Side - **Red**, Officer's Side - **Red**

54-60-0550

Zone C (Rear-Upper) - Two (2) Whelen RB6 series rotating beacons shall be mounted, one each side, at the upper rear corners of the apparatus.

Zone C (Rear-Upper Center) - One (1) Whelen 6E series halogen light shall be mounted, at the upper center portion of the apparatus rear.

54-62-1150

The lens colors shall be as follows:

Driver's Side Rotator - **Red**
Officer's Side Rotator - **Red**
Upper Rear Center Warning - **Amber**

54-70-1400

Zone C (Rear-Lower) - Two (2) Whelen model 600 halogen lights with chrome bezels shall be supplied and installed. The lights shall be located at the lower rear of the apparatus, one each side.

54-72-1000

The lens colors shall be as follows:

Driver's Side - **Red**.
Officer's Side - **Red**.

54-98-0000

CERTIFICATE

This warning light system shall be certified by Whelen when installed in conformance with Whelen mounting parameters to meet the requirements as noted in Chapter 9 of the 1999 revision of NFPA 1901 Fire Apparatus Standard.

58-00-0610

SIREN

One (1) Whelen electronic siren, model # 295HFSA1 shall be furnished and installed. It shall be 100 watts and feature wail, yelp, phaser, air horn and manual wail. The microphone shall have noise canceling circuitry and Public Address override.

58-09-1200

The electronic siren control shall be mounted on top of the dash.

58-10-0200

SIREN SPEAKER(S)

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58-10-9000

One (1) siren speaker(s), with a 100 watt driver shall be provided and installed.

70-00-0050

The siren speaker(s) shall be recessed in the left side front bumper.

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EQUIPMENT SECTION

EQUIPMENT

The following equipment (if listed below) shall be supplied with the apparatus. It shall be shipped loose unless detailed below or otherwise in these specifications.

70-00-1100

One (1) 10 ft. Duo Safety #585-A aluminum folding ladder, with slip resistant end shoes, shall be provided.

70-00-7600

One (1) 14 ft. Duo Safety #775-A aluminum roof ladder, with folding roof hooks and prong feet, shall be provided.

70-01-2200

One (1) 24 ft. Duo Safety #900-A two-section aluminum extension ladder, with prong feet, shall be provided.

99-99-1100

PURCHASER RESPONSIBILITY

It shall be the responsibility of the Purchaser to furnish any other recommended items not detailed in these specifications.

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