

# 1500 GPM Challenger Side Pumper

CH002

00-00-4100



## ***APPARATUS PROPOSAL SPECIFICATIONS***

***Darley Apparatus***

***For***

***Department Name***

***City, State***

Representative Name:  
Date:  
CH002

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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.

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### FIRE APPARATUS SPECIFICATIONS

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#### 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.

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#### PAYMENT REQUIREMENTS

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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.

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#### DRAWING REQUIREMENTS

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##### 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.

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### **WARRANTY REQUIREMENTS**

00-55-1450

### **WARRANTY**

The following warranties shall be provided:

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### **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.

00-55-4800

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

### **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.

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

### **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.

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

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### **MANUAL AND DATA REQUIREMENTS**

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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.

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### **CHASSIS PROVIDER**

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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.

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## CHASSIS SPECIFICATIONS

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### FREIGHTLINER M2 106MD CONVENTIONAL CHASSIS

#### GENERAL SPECIFICATIONS

#### MODEL

BUSINESS CLASS M2 106MD CONVENTIONAL CHASSIS

SET BACK AXLE TRUCK  
STRAIGHT TRUCK PROVISION  
LH PRIMARY STEERING LOCATION  
FIRE SERVICE - EMERGENCY VEHICLES BUSINESS SEGMENT  
FIRE TANK/PUMPER - MAIN DRIVELINE DRIVEN SPLIT-SHAFT PTO/PUMP

EXPECTED FRONT AXLE LOAD: 12000LBS  
EXPECTED REAR AXLE LOAD: 23000LBS  
EXPECTED GVW CAPACITY: 35000 LBS

#### ENGINE

330HP Engine

LEECE NEVILLE 12V 270 AMP 4949PA PAD MOUNT ALTERNATOR  
THREE (3) ALLIANCE 1031 GRP31 12V MF 1520 CCA THREADED STUD BATTERIES  
BATTERY BOX FRAME MTD  
SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB  
FRAME GROUND RETURN FOR BATTERY CABLES  
POSITIVE POST FOR JUMP START

WABCO 15.5 CFM AIR COMPRESSOR  
NO RETARDER

SINGLE HORIZONTAL MUFFLER, W/HORIZONTAL TAIL PIPE EXHAUST, RIGHT HAND MOUNTED  
HORTON HT650 FRONTAL AIR ON/OFF ENGINE FAN CLUTCH  
870 SQUARE INCH RADIATOR  
PHILLIPS-TEMRO 1000 WATT/115 VOLT BLOCK HEATER  
BLACK PLASTIC ENGINE HEATER RECEPTACLE MOUNTED UNDER LEFT HAND DOOR  
DELCO 12V 28MT STARTER

#### TRANSMISSION AND EQUIPMENT

ALLISON 3000EVS AUTOMATIC TRANSMISSION W/PTO PROVISION FOR FIRE/EMERGENCY  
WTEC TRANSMISSION PROGRAMMING - 5 SPEED FIRE & EMER 1 (PUMPER)  
ELECTRONIC TRANSMISSION CUSTOMER ACCESS CONNECTOR MOUNTED BOC  
MAGNETIC PLUGS, ENGINE DRAIN TRANSMISSION DRAIN, AXLE(S) FILL & DRAIN PUSH BUTTON,  
ELECTRONIC SHIFT CONTROL, DASH MOUNTED

TRANSMISSION OIL CHECK AND FILL WITH ELECTRONIC OIL LEVEL CHECK  
WATER TO OIL TRANSMISSION COOLER - IN RADIATOR END TANK

#### FRONT AXLE AND SUSPENSION

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MERITOR FRONT AXLE @ 12,000  
 MERITOR 16.5 X 5 "Q+" CAST SPDR CAM FRT BRKS, DBLE ANCHOR, FAB SHOES  
 FIRE AND EMERGENCY SEVERE SERVICE, NON-ASBESTOS FRONT LINING  
 CHICAGO RAWHIDE SCOTSEAL FRONT OIL SEALS  
 MERITOR AUTOMATIC FRONT SLACK ADJUSTRS

TRW THP-60 POWER STEERING  
 POWER STEERING PUMP  
 2 QUART SEE THROUGH POWER STEERING RESERVOIR

12,000# TAPERLEAF FRONT SUSPENSION  
 FRONT SHOCK ABSORBERS

## REAR AXLE AND SUSPENSION

MERITOR RS-23-160 R-SRS SINGLE REAR AXLE @ 23,000#  
 5.38 AXLE RATIO  
 MERITOR 16.5X7 Q+ CAST SPIDER CAM REAR BRKS, DBLE ANCHOR, FAB'D SHOES  
 FIRE AND EMERGENCY SEVERE SERVICE, NON-ASBESTOS REAR LINING  
 CHICAGO RAWHIDE SCOTSEAL REAR OIL SEALS  
 MERITOR AUTOMATIC REAR SLACK ADJUSTERS  
 23,000# FLAT LEAF REAR SPRING SUSPENSION W/HELPER, WITH RADIUS ROD  
 SPRING SUSPENSION - NO AXLE SPACERS

## BRAKE SYSTEM EQUIPMENT

AIR BRAKE PACKAGE  
 WABCO 4S/4M ABS W/O TRACTION CONTROL ENHANCEMENT  
 BW AD-9 BRAKE LINE AIR DRYER W/HEATER  
 STEEL AIR BRAKE RESERVOIRS  
 BW DV-2 AUTO DRAIN VALVE W/O HEATER - ALL TANKS  
 TRAILER CONNECTION  
 NO TRAILER AIR HOSE  
 UPGRADED CHASSIS MULTIPLEXING UNIT  
 UPGRADED CAB MULTIPLEXING UNIT

WHEELBASE \_\_\_\_\_

## FRAME

11/32" X 3-1/2" X 10-15/16" STEEL FRAME (8.73MM X 277.8/.344" X 10.94"  
 1/4"(6MM) C-CHANNEL INNER FRAME REINFORCEMENT  
 1900MM (75") REAR FRAME OVERHANG  
 SQUARE END OF FRAME  
 STANDARD REARMOST CROSSMEMBER  
 STANDARD SUSPENSION CROSSMEMBER

## CHASSIS EQUIPMENT

THREE-PIECE 14" CHROMED STEEL BUMPER WITH COLLAPSIBLE ENDS  
 FRONT TOW HOOKS - FRAME MOUNTED



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### FUEL TANKS AND EQUIPMENT

50 GALLON/189 LITER RECTANGULAR ALUMINUM FUEL TANK RH  
NO LH FUEL TANK  
RECTANGULAR FUEL TANK  
FUEL TANK FORWARD

### FRONT TIRES, HUBS, WHEELS

MICHELIN XZA2 PER AXLE RATING  
ACCURIDE STEEL DISC FRONT WHEELS

### REAR DRIVE TIRES, HUBS, WHEELS

MICHELIN XZA2 PER AXLE RATING  
ACCURIDE STEEL DISC REAR WHEELS

### CAB EXTERIOR

154" BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB  
RUBBER CAB MOUNTS  
EXTERIOR GRAB HANDLES WITH SINGLE RUBBER INSERT, LH/RH  
HOOD MOUNTED CHROMED PLASTIC GRILLE  
FIBERGLASS HOOD  
DUAL ELECTRIC HORNS  
ALL LOCKS KEYED THE SAME  
REAR LICENSE PLATE MOUNT END OF FRAME  
INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL

(5) AMBER MARKER LIGHTS  
INTEGRAL STOP/TAIL/BACKUP LIGHTS  
STANDARD FRONT TURN SIGNAL LAMPS  
DUAL BRIGHT WEST COAST MIRRORS  
DOOR MOUNTED MIRRORS

102" EQUIPMENT WIDTH  
LH/RH 8" CONVEX MIRRORS, BRIGHT FINISH, MTD UNDER PRIMARY MIRRORS  
STANDARD SIDE/REAR REFLECTORS  
63"X14" TINTED REAR WINDOW  
TINTED DOOR GLASS LH & RH WITH TINTED NON-OPERATING WING WINDOWS  
MANUAL DOOR WINDOW REGULATORS  
TINTED WINDSHIELD  
8 LITER WINDSHIELD WASHER RESERVOIR W/O FLUID LEVEL INDICATOR

### CAB INTERIOR

OPAL GRAY VINYL INTERIOR  
MOLDED PLASTIC DOOR PANEL WITH ALUMINUM KICKPLATE LOWER DOOR  
MOLDED PLASTIC DOOR PANEL WITH ALUMINUM KICKPLATE LOWER DOOR  
GRAY VINYL MATS WITH INSULATION  
DASH MOUNTED ASH TRAYS & LIGHTER  
FORWARD ROOF MOUNTED CONSOLE WITH UPPER STORAGE COMPARTMENTS W/ONETTING

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HEATER, DEFROSTER AND AIR CONDITIONER  
 MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH  
 STANDARD HEATER PLUMBING  
 SANDEN COMPACT AIR CONDITIONER COMPRESSOR  
 BINARY CONTROL, R-134A  
 CAB INSULATION

SOLID-STATE CIRCUIT PROTECTION AND FUSES  
 DOME LITE W/3-WAY SWITCH ACTIVATED BY LH AND RH DOORS  
 CAB DOOR LATCHES WITH MANUAL DOOR LOCKS

SEATS INC DRIVER SEAT  
 SEATS INC PASSENGER  
 SEATS INC CREW (3)  
 LH/RH INTEGRAL DOOR PANEL ARM RESTS  
 VINYL W/VINYL INSERT, DRIVER'S SEAT  
 VINYL W/VINYL INSERT, PASSENGER SEAT  
 3 POINT FIXED D-RING RETRACTOR DRIVER AND PASSENGER SEATBELTS  
 ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN  
 (18") LK FOUR-SPOKE CHARCOAL STEERING WHEEL

DRIVR/PASS INTER SUN VISORS  
 LOW AIR PRESSURE LIGHT AND BUZZER  
 PRIMARY & SECONDARY AIR PRESSURE GAUGES  
 ENG COMPART MTD AIR RESTRIC INDIC W/ GRADUATIONS, W/WARNING LIGHT IN DASH  
 CRUISE CONTROL - ELEC ENG, W/SWITCHES IN LH SWITCH PANEL  
 KEY OPERATED IGN SWITCH & INTEGRAL START POSITION; 4 POSITION OFF/RUN/START/ACC

ODO/TRIP/HOUR/DIAGNOSTIC/VOLTAGEDISPLAY 1X7 CHAR,26 WRNG LAMPS  
 DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1587/1708/1939, BELOW DASH

ELECTRIC FUEL GAUGE  
 ELECTRICAL ENGINE COOLANT TEMP GAUGE  
 TRANSMISSION OIL TEMPERATURE GAUGE  
 ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY  
 ELECTRIC ENGINE OIL PRESSURE GAUGE  
 ELECTRONIC MPH SPEEDOMETER W/ SECONDARY KPH SCALE, W/O ODOMETER  
 ELECTRONIC TACHOMETER 3000 RPM

DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY  
 SINGLE ELECTRIC WINDSHIELD WIPER MOTOR W/DELAY  
 MARKER LIGHT SWITCH INTEGRAL W/HEADLIGHT SWITCH  
 ONE VALVE PARKING BRAKE SYSTEM WITH WARNING INDICATOR  
 SELF CANCEL TURN SIGNAL SWITCH W/ DIMMER, WASHER/WIPER & HAZARD IN HANDLE

INTEGRAL ELECTRONIC TURN SIGNAL FLASHER

## PAINT DESIGNS

PAINT: ONE SOLID COLOR

Cab Color: IMRON \_\_\_ SPECIFY COLOR\_\_\_

Chassis: BLACK HIGH SOLIDS POLYURETHANE

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Front Wheels: IMRON \_\_\_ SPECIFY COLOR \_\_\_  
Rear Wheels: IMRON \_\_\_ SPECIFY COLOR \_\_\_

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### CHASSIS MODIFICATIONS

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#### CHASSIS MODIFICATIONS

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

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#### MASTER BATTERY SWITCH (Chassis Provided)

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

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#### 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.

07-52-1000

The receptacle shall be located below the driver door area.

#### FRONT MUDFLAPS

07-52-2000

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

#### 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):

- 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

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- 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.

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### **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.

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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.

17-00-1100

#### **SIDE DESIGN PUMP OPERATOR'S PANEL & MODULE**

17-04-5100

#### **SIDE PANEL MODULE**

A pump operator's side panel 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. .

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

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

A heavy duty rubber isolation material shall be provided between dissimilar metals during the mounting process. The substructure shall be painted before mounting to the chassis frame.

17-10-2000

#### **SIDE OPERATED PUMP PANEL**

The pump operator's control panel shall be located on the left side of the pump module.

#### PANELS

The pump panels shall be removable.

#### TRIM RINGS (Unless Color Graphics side Panel Used)

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

#### GAUGES AND CONTROLS

All controls and gauges shall be functionally grouped and installed to allow easy access for service and replacement.

The central midpoint or center line of any control shall not exceed 72 inches vertically above the base of the operators standing position.

Gauges (and/or flowmeters if present) shall be located as nearly adjacent to the valve control as possible. The height of all gauges shall not exceed 84 inches above the base of the operator's standing position.

17-10-5100

#### **SIDE PANELS - BLACK VINYL**

The pump compartment module shall have left and right side pump panels constructed of black vinyl clad

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aluminum sheets. The side pump panels shall be removable.

17-30-0800

## **GAUGE PANEL - BLACK VINYL**

The pump operator's upper gauge panel shall be located on the left side of the pump module above the main control panel and shall be vertically hinged. It shall be constructed from black vinyl clad aluminum and shall include two push button type latches.

17-30-1800

## **ACCESS PANEL - BLACK VINYL**

There shall be a vertically hinged upper access panel located above the main pump panel on the right side of the unit. It shall be constructed from black vinyl clad aluminum and have two push button type latches.

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.

17-32-1000

## **PUMP PANEL LIGHT SHIELD - LEFT**

One (1) polished, extruded aluminum light shield assembly shall be provided above the left side pump panel area. There shall be a minimum of two (2) weather resistant lights installed within the shield. A switch, located on the pump 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.

17-32-2500

## **STEP LIGHTS**

Two (2) step lights with noncorrosive rubber shock mountings shall be furnished, one each side at the front face of the body, near the runningboard surfaces. The lights shall be activated with a switch located in the cab.

17-32-3000

## **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 width of the side panel 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 at the time of proposal.

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

10-12-5500

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## **SINGLE STAGE FIRE PUMP**

The pump shall be a Darley LDM 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 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 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. A magnetic drain plug shall be provided. Transmission case shall include a dip stick for checking oil level.

The pump drive shaft shall be precision ground, heat treated alloy steel, with a minimum 2-1/2" x 10" spline 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 gear shift 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.

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



# 1500 GPM Challenger Side Pumper

## CH002

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 hand speed counter outlet shall be supplied on a pump panel for measuring engine RPM ratio. 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.

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**

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

CH002-0003

03-30-05

# 1500 GPM Challenger Side Pumper

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## 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.

11-01-2000

## 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:

### DISPLAY:

--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.

CH002-0003

03-30-05

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## CH002

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.

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.

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## CH002

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.

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.

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## CH002

12-18-0500 The valve(s) shall be Darley brand with a polished stainless steel ball.

### **TANK TO PUMP LINE (MANUAL)**

12-19-2000 One (1) 3" 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 manually controlled from the pump operator's panel.

### **TANK TO PUMP CHECK VALVE**

13-01-2000 The Darley fire pump suction inlet manifold shall be provided with an integral tank to pump check valve. The check valve shall be designed to automatically open when drafting from an onboard water tank, and close if the pump suction receives water pressure from an outside source.

### **2" TANK FILL**

15-20-0400 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.

### **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

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CH002

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.

15-54-1100

## 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.

15-58-1100

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

17-42-3200

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.

15-68-2200

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.

## TWO CROSSLAYS

Two (2) 1-3/4" crosslays shall be installed in the pump module above the pump. The crosslays shall each have capacity for 200 ft. of 1-3/4" double jacket fire hose.

The crosslays shall each have 2" plumbing and 2" self-locking valve and terminate with a 2" NPT x 1-1/2" NST chicksan type swivel up through the center of the crosslay flooring. The swivels shall allow hose out either side of the crosslay.

The outside edges of each side opening shall be trimmed with polished stainless steel.

17-42-3300

A manual valve control shall be furnished at the pump operator's panel for each.

17-41-7010

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.

## 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.

31-80-4100

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

## 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 compartments. 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.

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**

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.

34-32-1010

### **SIDE COMPARTMENTATION**

The following compartments shall be supplied on the apparatus:

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## LEFTCOMPARTMENTS

1.) One (1) compartment ahead of the rear wheels, approximately 31" wide x 65" high x 25" deep lower x 25" deep upper. The door opening shall be approximately 29" wide x 62" high. The compartment shall have approximately 30 cubic feet of space.

2.) One (1) compartment over the rear wheels, approximately 58" wide x 29" high x 25" deep. The door opening shall measure approximately 56" wide x 27" high. The compartment will have approximately 30 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 25" deep upper. The door opening shall be approximately 44" wide x 62" high. The compartment shall have approximately 44 cubic feet of space.

## RIGHT COMPARTMENTS

4.) One (1) compartment ahead of the rear wheels, approximately 31" wide x 65" high x 25" deep lower x 14" deep upper. The door opening shall be approximately 29" wide x 62" high. The compartment shall have approximately 17 cubic feet of space.

5.) One (1) compartment over the rear wheels, approximately 30" wide x 29" high x 14" deep. The door opening shall measure approximately 28" wide x 27" high. The compartment will have approximately 9 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.

34-33-1100

## **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.

35-40-0110

## **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.

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

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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.

37-10-5150

### **OVERHEAD LADDER RACK RIGHT**

An overhead automatic fold down ladder rack assembly shall be furnished at the body side. The rack shall be a 12 volt electric over hydraulic actuated pivot assembly, designed to pivot the ladder rack down from over the top of the high side compartments. A hinged door shall cover the ladder rack center vertical arms and shall open automatically when the ladder rack is lowered. The door shall also permit access to the actuator and safety lock if service is required.

There shall be a spring loaded quarter turn latch furnished to hold the ladders on the rack when it is in any position. An automatic safety latch shall hold the ladder rack in the stowed position.

Flashing halogen warning lights shall be provided at the front and rear of the ladder rack and shall activate automatically when the ladder rack is in the down position. When the ladder rack is in motion, the chassis backup alarm shall be activated. When the apparatus is equipped with hinged doors, an interlock shall be installed in the ladder rack circuit to prevent ladder rack operation when any doors are not closed.

The rack shall be actuated by a toggle switch located at the right side pump panel, in view of the ladder rack operator.

37-10-2300

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

37-10-2400

Storage shall be provided for one (1) 10 ft. folding attic ladder.

37-10-2650

There shall be two (2) sets of pike pole storage brackets included.

40-00-0000

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## CH002

### 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 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 of 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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CH002

40-26-4100

**CAB DOOR REFLECTIVE MATERIAL**

There shall be a minimum of 96 square inches of reflective material installed on the lower interior portion of each cab door.

40-26-4125

**CAB DOOR REFLECTIVE MATERIAL**

The reflective material shall be installed on the lower interior portion of the driver and officer cab doors.

40-26-4300

The color of the reflective material shall be **WHITE**.

50-00-0000

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CH002

## 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

CH002-0003

03-30-05

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CH002

## 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.

CH002-0003

03-30-05



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## CH002

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

CH002-0003

03-30-05

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## CH002

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)**

CH002-0003

03-30-05

# 1500 GPM Challenger Side Pumper

## CH002

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.

# 1500 GPM Challenger Side Pumper

## CH002

### **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.