FIRE APPARATUS SPECIFICATIONS

1000 GPM CAFS (LSMC) Vision Series
Snow Dragon Pumper (1)

For

Dalian Subway Fire Department
Dalian, China

Darley Job 3237

APPROVED BY (PRINT NAME):_____________________________________

SIGNATURE:_____________________________________________________

DATE:__________________________________________________________

June 1, 2015

GENERAL INFORMATION
These specifications are a detailed description of the apparatus, and equipment (if specified), to be furnished by W.S. Darley & Co. and is intended to outline the quality and design of the apparatus desired.

The apparatus covered by this specification shall be new, unused, and the latest production design and that which is furnished to Fire Departments in general.

This apparatus shall be constructed in its entirety within the continental United States.

Use Shop Notes to add Dealer info into the specifications. Representative company, name, address, phone, fax, email.

---ADMINISTRATION SECTION---
FIRE APPARATUS SPECIFICATIONS

Instruction To Bidders

ADMINISTRATION

Product Quality And Workmanship

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.

PAYMENT REQUIREMENTS

- Various payment terms. Hit insert to pick options.

- Darley - SEE LC

See payment terms as agreed between Darley and Customer, per LC.

DRAWING REQUIREMENTS

- Hit insert to choose drawing requirements.

- Darley Apparatus Drawings For Approval

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, 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.

The purchaser shall review the drawings. Any discrepancies and/or mutually agreed upon modifications shall be noted on the drawings. The purchaser shall return one complete set of drawings, with authorized approval signature(s), to the Darley representative.

**Warranty Requirements**

**WARRANTY REQUIREMENTS**

**Warranty Terms**

**WARRANTY**

The following warrantees shall be provided:

- **1YR Darley Apparatus Warranty**

**ONE YEAR DARLEY APPARATUS WARRANTY**

The Darley 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 apparatus to the destination, as follows:

Darley conditionally warranties new fire apparatus as manufactured by Darley for a period of one (1) year from date of pick up or delivery (whichever comes first), except chassis and certain other components not manufactured by Darley such as noted below.

Under this warranty, Darley shall furnish replacement parts for those that have failed due to defective materials or workmanship; where the is no indication of abuse, neglect, unusual or other than normal service, providing that such parts are, at Darley's option, are made available for inspection; and at Darley's request, returned to the Darley manufacturing facility or other location designated by Darley (transportation charges prepaid) within thirty (30) days after the date of failure or within one (1) year from the date of pick or delivery of apparatus to the destination, whichever occurs first; and inspection by Darley indicating that the failure was attributed to defective material or workmanship.

Darley further agree to furnish or reimburse, at an agreed upon cost before the work is conducted, for the labor to install the replacement part(s), if all condition outlined above are met.

The warranty on a chassis, engine, transmission, tires and tubes, batteries, electrical lamps, and other devices not manufactured by Darley, which are subject to deterioration or normal wear, etc., is limited to the warranty of the manufacturer, thereof.

This warranty shall not apply to any fire apparatus, which shall have been repaired or altered without Darley's authorization.

This warranty shall not apply to those items, which are usually considered normal maintenance and upkeep services; including but not limited to lubrication, proper adjustments, or other items.

**ENG. NOTES**

- Connecticut is two year minimum per 1998 law, bill #478, file #129.
One (1)
00-65-0600

Demonstration Requirements

DEMONSTRATION REQUIREMENTS
- Darley Demo at Purchaser (Darley China)

DEMONSTRATION AT PURCHASER (DARLEY CHINA)

Upon delivery of the completed apparatus, a minimum of one Darley authorized and trained individual shall conduct a demonstration session or sessions for purchaser personnel. Demonstration shall include all aspects of apparatus operation. The demonstration schedule shall be mutually agreed upon by the purchaser and the manufacturer's representative.

ENG. NOTES
- Dealer responsible for training.- Dealer to "plug in" dollar figure.

S One (1)
00-65-6500

- Darley Export Preparation

PREPARATION FOR APPARATUS EXPORT

Upon completion of the Darley apparatus and in preparation to transport the apparatus to the port of sailing, the apparatus shall be coated with a special shipping material to protect the exterior finish while sailing.

The material shall reduce the threat of corrosion due to salt spray and other harmful occurrences during overseas transit. The material shall be removable with petroleum solvents and emulsion cleaners.

S One (1)
00-66-8000

Pump Panel Protection

PUMP PANEL PROTECTION

The pump module pump panels shall be covered to protect the panels during shipment.

S One (1)
00-66-6800

Apparatus Undercoating (Darley)

APPARATUS UNDERCOATING

The apparatus shall be undercoated as needed for export for ocean freight.

One (1)
00-68-0500

Manual And Data Requirements

MANUAL AND DATA REQUIREMENTS
Darley Manuals & Certificate

FIRE APPARATUS DOCUMENTATION

At the time of delivery, Darley shall supply the following:

---Two (2) copies of the manufacturer's record of construction details.
---Two (2) sets of operation and service documentation/manuals, as available.

NOTE: It is requested that the operation and service manuals each contain a wiring diagram; a module plumbing diagram; and a parts catalog. NOTE: The parts catalog portion shall be furnished only as available from each chassis manufacturer, and as available (if available) from other component vendors and from Darley.
FACTORY COMPLETE CERTIFICATE

A Darley factory complete fire truck certificate shall be supplied.

ENG. NOTES

NFPA requirements:-Two (2) sets of Apparatus Construction Details.-Two (2) sets of Operations and Service Manuals.

S One (1)
00-68-5000

Video (Operation And Maintenance)

VIDEO

One (1) video shall be provided for the general operation and general maintenance; for the chassis, the CAFS module, electrical lighting, the body, and water/foam tanks.

S One (1)
00-68-5010

Manuals And Info Shipped Prior To Trucks

MANUALS AND INFORMATION SHIPPED PRIOR TO TRUCKS

One (1) set of all of the available chassis, body, water/foam tank, Darley manuals, and the Video and PowerPoint shall be shipped to The Darley China Agency prior to the truck shipping to China.

One (1)
00-80-0500

Chassis Supplied By

- Darley Supplied Chassis

One (1)
00-80-2000

The chassis, as detailed in these specifications, shall be ordered and supplied by Darley. The chassis portion of the contract shall be paid for as detailed in the Darley proposal and contract verbiage.

One (1)
00-99-2500

Proposal - Darley Rights

MANUFACTURER RIGHTS

The Darley Company reserves the right to incorporate the latest technology or standards, including changes to apparatus features and brand names, or model or equipment being supplied with the vehicle.

---CHASSIS SPECIFICATIONS---
W.S. Darley & Co

CHASSIS SPECIFICATIONS

ENG. NOTES
--Large commercial chassis section upgradeable to other commercial chassis'. If custom chassis desired, go to EDIT, HEADER, and delete the chassis unit. Create separate custom chassis and insert it with "other quote". Make sure sequence number i

One (1)
05-05-1750

Ford F650 Four Door 4x2 Chassis (330 Engine) (Air Brakes)

CHASSIS SPECIFICATIONS

MODEL

The chassis shall be a Ford F650 four door 4x2 chassis
The wheelbase shall be 212"
The CA shall be 102"

The front GVWR shall be 10,000 lbs
The rear GVWR shall be 18,500 lbs
The wheels are painted steel wheels
Goodyear tires
Air brakes
65 gallon aluminum fuel tank
Heavy duty alternators
Three batteries

The engine shall be a Ford 330 hp engine
The transmission shall be a Ford automatic transmission

The cab has an individual driver bucket seat and officer bucket seat
The cab has a crew bench seat

Am/FM stereo radio with auxiliary input audio jack and clock with speakers

Chrome bumper
Chrome grille

Fire/rescue prep package

The paint shall be one color: Ford standard E4 Red.

ENG. NOTES
--ESTIMATED prices only.--Sample Specs only.--Get a current quote from a Darley authorized chassis dealer.

NOTES

Our cost = $70,168 with air brakes and 330 hp engine (Larry Geissler 5-21-15). Previous Dalian Snow Dragon chassis' were $70,849. China spreadsheet shows the new chassis is $1,845 more than previous ($70,829 + $1,845) = $72,674. Add $1,430 for 330 hp engine = $74,103 (md 5-29-15).

One (1)
07-00-0000

---CHASSIS MODIFICATION SECTION---

DALIANSN-0001
CHASSIS MODIFICATIONS

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

S One (1) 07-00-1100
Two Front Tow Hooks

FRONT TOW HOOKS

Two (2) front tow hooks shall be provided and shall be bolted to the frame, behind the front bumper.

S One (1) 07-00-1150
Install Bostrom SCBA Seats In Cab

BOSTROM CAB SEATS

The officer seat and the crew seating provided by Ford shall be replaced as follows:

---One (1) Bostrom 450 officer SCBA seat with seat switch and Load & Lock bracket on riser
---Two (2) Bostrom 400CT rear crew SCBA seats with seat switch and Load & Lock bracket on three person riser
---One (1) Bostrom singe rear crew 400CT SCBA seat with seat switch and Load & Lock bracket on three person riser (mounts between the two crew seats)

NOTE: The Darley "D" logo shall be on the seat backs.

NOTES

Previous job 3088 was quoted at $4,968. I added 3%. I'll get quote from Bostrom (md 10-17-13).
Seat cost with est shipping = $3,413 x 35% = $4,607 = 10 hr labor ($890) = $5,497 (md 10-18-13).
---Per Brianna 5-28-15, pricing still the same as 2013 with $105 fee for Logos. I'm adding 6% for 2013 to 2015 = total $5,938 (md 6-1-15).

S One (1) 07-00-1200
Urea Fill Port To Be Re-Located (Behind Access Door)

UREA LOCATION

The Urea fill port shall be behind an access door. It could be relocated to achieve this. If relocated, the exact location to be determined by Darley Engineering and shared with the Darley China Agency.

S One (1) 07-00-3000
12 Volt Outlet On Console

12 VOLT DASH OUTLET

One (1) 12 volt "cigarette" type outlet shall be installed in the center console.

S One (1) 07-02-8200
Control Console Between Seats

CONTROL CONSOLE BETWEEN SEATS

A control console shall be installed, on the cab floor, between the driver and officer seats. The console shall be unpainted, "DA" finished, smooth aluminum material with a black vinyl covered aluminum top.
The top shall be hinged toward the rear to allow easy access to components and wiring inside the console. The cover shall be fastened on the sides and front.

The top of the console shall contain items such as the rocker switch panel and door and accessory ajar lighting. It shall also contain the electronic siren head, fire pump shift control, and generator controls (as applicable).

**S Two (2) Fog Lights (RECESS IN BUMPER)**

**FOG LIGHTS BUMPER**

Two (2) approximate 4" x 5" amber fog lights shall be installed, recessed in the bumper, one each side, and shall be switched from the cab.

**Treadplate Running Boards (Four Door F550/GMC Type)**

**TREADPLATE RUNNING BOARDS**

Running boards, fabricated from bright aluminum treadplate, shall be supplied and installed below the cab doors. An intermediate step shall be provided, if the stepping height from the top of the running board to the floor of the cab exceeds 18". The running board height, from the ground to the top of the first step shall not exceed 24". A bright aluminum diamond plate vertical back splash, from the top of the running board to below the cab shall be provided and installed. The back splash shall be mounted to allow for independent movement of the cab.

**One (1) Master Battery Switch (Commercial Cab)**

**MASTER SWITCH - CHASSIS ON/OFF**

A master switch shall be provided in the cab in a convenient location. This switch shall cut all power to the cab and body accessories. This master switch shall include a green/master switch "on" pilot light.

**One (1) Switch - High Idle**

**HIGH IDLE FEATURE**

A high idle switch shall be mounted on the dash or in the center console near driver controls. The high rpm shall be preset to a specified rpm. A light shall be provided when the switch is activated.

**One (1) Set Of SS Covers (Realwheels) Light Chassis**

**STAINLESS STEEL WHEEL COVERS**

One (1) set of stainless steel RealWheels wheel covers shall be installed on the chassis wheels. Stainless steel lug nut covers and valve stem extensions for the inner rear dual wheel shall be included.

**ENG. NOTES**

- Light duty chassis.

**One (1) Mud Flaps (Small Chassis) (Rear) (2) With ANTI SAIL Feature**

**REAR MUDFLAPS WITH ANTI SAIL FEATURE**

Two (2) black hard rubber mudflaps shall be installed behind the rear wheels, one each side.
Each rear mudflap shall have a chrome anti sail framework installed to hold the mudflap in position, and not allow it to "sail" and rest against the chassis tailpipe located behind the rear wheels, on this type of chassis.

S One (1) 
07-52-9900 
Tire Wrench  
TIRE WRENCH

One (1) tire wrench for the chassis supplied, shall be furnished.

One (1) 
07-80-0200 
Exhaust Right Rear Wheels (Heat Shield)  
CHASSIS EXHAUST

The chassis exhaust pipe shall discharge at rear wheels as provided with the chassis. A heat shield shall be provided between the pipe and the bottom of the body compartment.

ENG. NOTES

- Should be quoted and ordered with chassis.

One (1) 
07-90-0500 
"General" Back Up Alarm  
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.

S One (1) 
07-95-0500 
Fluid and I.D. Data Plate (Chinese)  
IDENTIFICATION DATA PLATE

SHOP NOTES

The fluid and I.D plate shall be the "new style" with information provided in Chinese.

NOTE: Darley shall stamp the VIN number and the Engine serial number into the side of the chassis frame rail in the area near the batteries.

S One (1) 
07-95-5000 
Spare Tire & Wheel  
SPARE TIRE AND WHEEL

One (1) spare tire and wheel shall be furnished.

---PUMP, MODULE, AND RELATED ITEMS---
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.

A heavy duty rubber isolation material shall be provided between dissimilar metals during the mounting process.

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

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.

Gauges (and/or flowmeters if present) shall be located as nearly adjacent to the valve control as possible.

SIDE PANELS

The pump compartment module shall have left and right side pump panels constructed of brushed stainless steel sheets. The side pump panels shall be removable.

GAUGE PANEL - STAINLESS STEEL
The pump operator's upper gauge panel shall be located on the left side of the pump module above the main control panel. It shall be constructed from brushed stainless steel. It shall be vertically hinged and shall have two latches.

**One (1)**  
17-30-2500  
**Stainless Upper Access Panel - Vertical Hinge (Right)**

**ACCESS PANEL - STAINLESS STEEL**

There shall be a hinged upper access panel located above the main pump panel on the right side of the pump module. It shall be constructed from brushed stainless steel. It shall be vertically hinged and shall have two latches.

**One (1)**  
17-35-4000  
**Color Coded Labels (Alternate Language)**

**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.

The labels shall be provided in a language other than English. Details of the alternate language and function descriptions shall be approved prior to apparatus assembly.

**SHOP NOTES**

NOTE: The labels shall be provided in Chinese language

**One (1)**  
17-32-1000  
**Light Shield - Left Pump Panel (LED)**

**PUMP PANEL LIGHT SHIELD (LED) LEFT**

One (1) polished extruded aluminum light shield assembly shall be provided above the left side pump panel area. There shall be LED lights installed within the shield. A switch, located on the pump operator's panel shall be provided to activate the lights.

**One (1)**  
17-32-3000  
**Running Boards - Treadplate/Side Panel**

**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 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.

**One (1)**  
09-01-4999  
**Treadplate Front Of Module**

**TREADPLATE FRONT OF MODULE**
The front of the module shall be covered with a sheet of aluminum treadplate.

**Plumbing And CAFS Schematic On Panel**

**PUMP & CAFS PLUMBING SCHEMATIC ON PANEL**

A pump and CAFS plumbing schematic shall be provided on the pump operator’s panel. The text shall be in Chinese.

**Pump System - LSMC 1000 Single Stage**
SINGLE STAGE FIRE PUMP (CAFS)

The pump shall be a Darley LSMC single stage pump, rated at 1000 GPM.

A split shaft driven centrifugal pump rated up to 1000 GPM @ 150 PSI, shall be provided. The pump shall be placed in gear from the chassis cab. The pump shift shall be clearly labeled.

The pump shall have a nickel alloy casing. A bronze, double hubbed impeller, mechanically and hydraulically balanced, shall be installed on a splined stainless steel shaft.

The impeller shaft shall be supported by oil lubricated ball bearings. The pump gear case shall be silent running, with helically cut gears, fully supported by ball bearings, and shall have two (2) replaceable, bronze seal rings.

CAFS COMPATIBLE

The pump transmission shall be designed to accommodate an integrated continuous duty, rotary screw air compressor for CAFS.

Mechanical Seal - Darley

DARLEY MECHANICAL SEAL

The fire pump shall be furnished with a Darley maintenance free mechanical seal; manufactured using the material silicon carbide (no exceptions). The mechanical seal shall be a non-contacting, non-wearing dual seal design. The lip seal shall eliminate leakage on a wet pump while parked on standby. The second seal shall allow a drip rate for cooling and lubrication while pumping.

ENG. NOTES

--Mechanical seal available in place of packing at no additional charge Packing available in place of mechanical seal, at no additional charge(md 11-2-07).

Pump Certification (No NFPA Testing Required)

PUMP CERTIFICATION

The fire pump shall be tested to meet the flow requirements of the pump installed on the apparatus. A written certification shall be provided.

Pump Shift

PUMP SHIFT

One (1) air powered pump shift shall be installed in the cab. 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.

**Anodes For Pump (2)**

**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.

**Pump System Lock-Up On Chassis Transmission**

**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.

**Driveline Modification - Pump Installation**

**DRIVELINE MODIFICATION**

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

**Primer With Reservoir - (1) Electric**

**ELECTRIC PRIMER**

The fire pump priming system shall consist of one (1) 12V positive displacement type rotary vane primer. The primer shall be approved per NFPA 1901 recommendations. The primer shall include a lubrication fluid reservoir. The priming pump shall be constructed of heat treated aluminum and hard coat anodized.

A single, push-pull control shall be located on the pump operator's panel with a "Pull to Prime - Push To Close" label.

**NOTE:** The primer shall have Chinese artwork.

**Pressure Governor - Darley AutoControl**

**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 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. It shall indicate that the pump is engaged in the proper stationary pumping position, and that the parking brake is set.

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.

SHOP NOTES

NOTE: The governor shall read in Metric and Chinese.

ENG. NOTES

-Available for Cummins, Cat, Detroit, and IH engines.

S  One (1)
17-71-1100

4" Master Pressure And Intake Gauges (PSI-KPA)

4" MASTER PRESSURE GAUGE

A 4" liquid filled master pressure gauge with stainless steel bezel shall be provided. The gauge shall be located on the pump operator's panel.

4" MASTER INTAKE GAUGE

A 4" liquid filled master intake gauge with stainless steel bezel shall be provided. The gauge shall be located on the pump operator's panel.

NOTE: It is desired that the 4" master gauges read in metric or dual scales.

S  One (1)
11-04-1000

Heat Exchanger System

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.

ENG. NOTES

Available on most Darley pumps. Consult Darley pump literature and/or pump Engineering. Pump larger than 1500 gpm and 300 hp engine or less, a tube style heat exchanger also required.
One (1) Master Drain - Isolated Rotary Type

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.

One (1) Individual 1/4 Turn Drains

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 the module 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.

One (1) Main Suction Inlets (4" to 5")

SUCTION INLETS

S One (1) Suction Inlet - Left Side - 6

6" LEFT SIDE INLET

A 6" suction steamer inlet with male NH threads shall be provided, on the left side pump panel. A polished stainless steel trim ring shall be provided and installed around opening on pump panel. The inlet shall have a removable screen.

Suction Inlet Cap (With Logo)

INLET CAP

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.

S One (1) Suction Inlet - Right Side - 6

6" RIGHT SIDE INLET

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

Suction Inlet Cap (With Logo)

INLET CAP

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.

One (1) Pump ID Plate On Panel

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.

**Plumbing System - STAINLESS/BRASS**

**PLUMBING SYSTEM (STAINLESS/BRASS)**

All auxiliary suction and discharge plumbing related fittings, waterways, and manifolds shall be fabricated with stainless steel pipe, brass or high pressure hose with stainless steel couplings. Galvanized components and/or iron pipe components are not acceptable.

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 1-1/2" 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.

**Suction - 2-1/2" Left - Darley (Side Control) (No Storz) (No Plug)**

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

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

The suction shall terminate with a 2-1/2" female NST chrome inlet swivel, and a brass inlet strainer.

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

**SHOP NOTES**

NOTE: A chain longer than standard shall be supplied.

**ENG. NOTES**

-Insert quantity in Quantity column.-At least one auxiliary inlet needed as standard for NFPA compliance.--Control at valve.

**Direct Water Tank Fill - 2-1/2" - LEFT Side Panel (No Storz) (No Plug)**
LEFT SIDE TANK FILL (MANUAL)

One (1) 2-1/2" direct tank fill shall be provided at the LEFT side pump panel, with a strainer, and NST threads. The valve control shall be vertically mounted alongside the valve body. A polished stainless steel trim ring shall be installed around the inlet opening. The tank fill shall include a check valve to prevent water discharge from the tank.

SHOP NOTES

NOTE: A chain longer than standard shall be supplied.

Tank To Pump 3" (Manual)

TANK TO PUMP LINE (MANUAL)

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.

Integral Check Valve

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 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

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

SHOP NOTES

NOTE: The tank fill shall incorporate an anti-siphon design.

Darley AutoCAFS I - 120 CFM Package (LSMC)

AUTOCAFS - COMPRESSED AIR FOAM SYSTEM

There shall be provided, a high energy, automatic compressed air foam system (AutoCAFS). The system shall be designed to meet all applicable NFPA requirements. It shall be sized to provide at least 240 gallons per minute water flow and 120 cubic feet per minute air flow at 125 PSI.

The air compressor shall be a high quality, industrial rated, modulating, continuous duty, rotary screw design. The air compressor shall be mechanically gear driven by the main pump split shaft transfer case and shall be so designed as to provide optimum performance at 70% of rated engine RPM.

The air compressor gear train shall provide a means to engage and disengage air compressor as required.
The air compressor system shall include a pressurized oil lubrication system, oil separator, oil filter, inlet air filter, and modulating inlet air control. The air compressor shall be provided with an (Auto/Manual) air pressure control valve located at the panel to permit either automatic balancing of air to water pressure for CAFS use or, if desired, manual air pressure adjustment for operating air tools at idle. The air compressor system shall also have mounted on the panel a compressor engaged light, hydraulic oil temperature gauge, and a high temperature oil warning light/buzzer.

Flow and pressure gauges shall be provided to monitor CAFS system total air and water discharge conditions. Gauges and controls shall be positioned and clearly marked so as to provide simple and easy operation.

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 controlled to produce a well operating and reliable CAFS unit.

This automatic compressed air foam system (AutoCAFS) shall be completely installed and tested before delivery by the factory.

**FOAM OUTLET**

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.

**ENG. NOTES**

NOTE: FoamPro 1601 to be plumbed to two crosslays. Add to shop notes in the quote.

### CAFS Air Compressor Shift

**AIR COMPRESSOR SHIFT**

An air powered (CAFS) air compressor shift shall be installed to engage the air compressor complete with a single green colored “ENGAGED” indicator light. The air compressor shift shall include an interlock system, installed to eliminate the possibility of improperly shifting the air compressor while the water pump is rotating. The air compressor can be engaged only when the water pump is disengaged and the apparatus is in a stationary position. NO EXCEPTIONS

**ENG. NOTES**

Non LDMBC application.

### CAFS Air Pressure Gauge

**CAFS AIR PRESSURE GAUGE**

The compressed air foam system shall utilize an air pressure gauge. It shall be installed on the operator control panel. This CAFS gauge shall be installed by the CAFS pumping system manufacturer.

**SHOP NOTES**

NOTE: The gauge shall read in METRIC.

### CAFS Pressure Control - Mounted On Panel

The compressed air foam system shall utilize an air pressure control system. The system includes a 1/4
turn auto/manual selector valve and an adjustable pressure regulator. It allows the pump operator to choose between automatic air pressure balancing of air and water pressure or manual regulating of the air compressor pressure. It shall be mounted on the pump operator's control panel near the air pressure gauge.

**Air Outlet - 1/4" - CAFS**

**AIR OUTLET 1/4" CA FS SUPPLY**

There shall be a brass 1/4" female air hose quick disconnect fitting mounted on the right side pump panel. The fitting shall be connected to the CAFS air compressor. There shall be an adjustable regulator installed to provide compressed air to the side panel. A male quick disconnect fitting shall also be supplied.

**Eng. Notes**

This outlet is only available when CAFS is specified it is supplied by the CAFS air compressor. It includes an adjustable regulator.

**One (1)**

14-12-1000

**CAFS Operation Manuals**

**CAFS OPERATORS MANUALS**

Two (2) CAFS, compressed air foam system, instruction manuals shall be provided upon delivery. The manuals shall be a guide for operation and maintenance of the CAFS, and shall be as prepared and supplied by the apparatus and CAFS manufacturer.

**Eng. Notes**

Include with all CAFS systems.

**One (1)**

14-14-1000

**FoamPro 2001 (For Single Tank) (CAFS)**

**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 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. The system shall be installed by a certified FoamPro dealer only, and shall be fully calibrated and tested for proper operation prior to delivery.

SHOP NOTES

NOTE: The FoamPro shall read in Metric and shall have Chinese artwork, and the Darley logo.

ENG. NOTES

- Select 1 foam tank.

S One (1) 15-20-0400

Discharges - Two (2) 2-1/2" Left Side - Darley (No Storz) (No Caps)

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

Two (2) 2-1/2" discharge outlets with 2-1/2" pipe and valve with 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.
One (1) Discharge Elbows (Short Version) (NO Storz) (NO Caps)

**ELBOWS FOR DISCHARGES**

The left side 2-1/2" discharges shall each have a "short" chrome 30 degree elbow.

**SHOP NOTES**

NOTE: Chains longer than standard shall be supplied.

One (1) Discharge - One (1) 2-1/2" Right Side (NO Storz)

**2-1/2" RIGHT SIDE DISCHARGE (Darley)**

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

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

One (1) Discharge Elbow - Chrome (1) (NO Storz) (NO Cap)

**ELBOW FOR DISCHARGE**

The right side 2-1/2" discharge shall have a "short" chrome 30 degree elbow.

**SHOP NOTES**

NOTE: Chain longer than standard shall be supplied.

One (1) One Right Side 2-1/2" Discharge (CAFS) (NO STORZ)

**2-1/2" RIGHT SIDE DISCHARGE (Darley) CAFS**

One (1) 2-1/2" discharge outlet with 2-1/2" pipe and valve with chrome NST threads shall be supplied at the right side panel. The 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.

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

**CAFS FOR RIGHT SIDE DISCHARGE**

The discharge shall be piped, including required check valves and 1/4 turn air flow injection valve, to provide water, foam, or compressed air foam.

**SHOP NOTES**

NOTE: A chain longer than standard shall be supplied.

One (1) Discharge Elbow - Chrome (1) (NO Storz) (NO Cap)

**ELBOW FOR DISCHARGE**

The right side 2-1/2" discharge shall have a "short" chrome 30 degree elbow (no cap).

**SHOP NOTES**

NOTE: Chain longer than standard shall be supplied.

One (1) Discharge - 3" Deck Gun Plumbing (Manual)

**DECK GUN DISCHARGE**

One (1) 3" deck pipe assembly with a 3" bronze slo-cloz 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.

**ENG. NOTES**

Pipe and valve assembly only. Flange and monitor are separate options.

One (1) Mounting Flange - 4 Bolt (Akron/Elkhart)

**DECK PIPE FLANGE**

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

One (1) CAFS T'd to Deck Gun Piping (Electric)

**2-1/2" CAFS DECK GUN DISCHARGE**

One (1) electrically controlled 2-1/2" CAFS line with mixer plumbing with mixer and 2-1/2" bronze ball valve shall be installed to supply CAFS to the deck gun discharge outlet detailed elsewhere in these specifications. The CAFS line and electric valve shall be connected to the deck gun piping above the 3" deck gun valve. The CAFS discharge control shall be located on the operators control panel.

**ENG. NOTES**

-Be sure this CAFS discharge is allowed within the CAFS kit you have chosen.-For individually controlled CAFS line. 3" deck gun piping must be chosen also.

One (1) Crosslays - Two (2) 1-3/4" - 2" Plumb (CAFS)

**TWO CROSSLAGS (CAFS)**

Two (2) 1-3/4" crosslays shall be installed above the pump. Each crosslay shall 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. A manual control shall be furnished at the pump operator's panel for each.

**ENG. NOTES**

-Be sure this CAFS discharge is allowed within the CAFS kit you have chosen.

One (1) Cover - Aluminum Crosslay
ALUMINUM CROSSLAY COVER

There shall be an aluminum cover for the crosslay(s). The cover shall be constructed of a minimum of 1/8" aluminum tread plate and be hinged with a stainless steel knuckle hinge. The cover shall be hinged to open toward the chassis cab. The cover shall have a hold down system that shall hold the cover down. A rubber type bumper shall be used to protect the cab paint from the cover.

RECESSED DUNNAGE ABOVE PUMP (WITH DOORS)

DUNNAGE AREA

A recessed, removable dunnage (storage) compartment shall be provided above the pump compartment and shall be full width of the pump compartment. The compartment shall be smooth aluminum material and shall be one piece. It shall be removable if needed.

DOORS

The dunnage area shall have a vertically hinged door with latch on each side.

ENG. NOTES

- Be sure open dunnage is feasible with crosslays, etc.

NOTES

From $817 to $1,117 for doors.

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.

SHOP NOTES

NOTE: The tank gauge shall be provided with Chinese artwork, as available from Fire Research.

FOAM LEVEL GAUGE

One (1) Fire Research electronic "Tank Vision" foam tank level gauge shall be installed on the pump operator's panel. The gauge shall have a LED display which flashes when the tank level reaches 25% of capacity. A built in calibration system shall allow the two transducers to be mounted with any tank configuration.

SHOP NOTES

NOTE: The tank gauge shall be provided with Chinese artwork, as available from Fire Research.

ENG. NOTES

NOTE: Use the heat resistant Setra transducers from FRC to improve gauge accuracy.

BODY CONSTRUCTION (GENERAL)
WATER TANK, FIRE BODY & RELATED COMPONENTS

BODY CONSTRUCTION

The body and water tank shall be fabricated using special high strength copolymer materials; providing a durable, impact resistant, corrosion resistant, and lightweight design.

ENG. NOTES

- Includes Section Header.

NOTES

QW is $27,877. Added $9,000 per approx "pad" on 3088 Lishui. Added another $2,000 to cover undercoating and some signage that Bo won't pay for = $38,877 (md 6-7-13).

Added 5% ($1,944) = $40,821 (md 6-1-15).

***-$12,854 = $27,967 to get to $285,275 for this order per China spreadsheet dated 6-1-15 (md).

S One (1)
19-01-0425

Non Integral Construction

BODY/TANK CONSTRUCTION

The body and water tank shall be fabricated using the same special high strength copolymer materials; providing a durable, impact resistant, corrosion resistant, and lightweight design. Due to the added strength and durability provided with this integral design, there shall be NO EXCEPTION to this requirement.

NOTES

QW is a deduction. Lishui was a positive $1,311. Quoting $1,357 here (md 6-7-13).

Added 5% ($68) = $1,425 (md 6-1-15).

One (1)
31-03-0100

Vision Poly Body Construction (Detailed)

COPOLYMER BODY CONSTRUCTION

The body shall be fabricated using special high strength, copolymer sheet materials, providing a durable, impact resistant, corrosion resistant, and lightweight body. The body shall be fabricated using Aristech TI-4007-L polymer (or equal) extruded sheets. All seams shall be fully welded. All outside corners on the body shall have a minimum 1/2" radius. The entire body shall be a welded assembly; assembled and painted prior to mounting on the subframe and the chassis.

Due to the importance of the strength and impact resistance of the copolymer material, there shall be no exception to these requirements.

Only builders who can show examples of previously constructed copolymer bodies shall be accepted.

One (1)
31-19-1500

Rear Tow Eyes - Frame Mounted (2)

REAR TOW EYES

Two (2) heavy duty laser cut steel tow eyes, 3/4" thick with a 3" I.D. cutout, shall each be bolted to the rear chassis frame rails with 3/4" grade 8 bolts. The tow eyes shall extend through the rear panel (or into the back wall of the rear compartment, if present).
The tow eyes shall be painted black unless specified otherwise.

**Vision Body - Compt Construction**

**COMPARTMENT CONSTRUCTION**

The compartments, including the floors, shall be constructed of the same heavy duty smooth copolymer material as used for the body. All seams shall be completely welded. Divider walls between compartments shall be single wall construction with a minimum wall thickness of 3/8". Compartment floors shall be a minimum of 1-1/8" thick and shall have a minimum of a 3/4" lip above bottom of the door opening, providing a sweep out design.

All compartment door opening lips shall be protected with polished stainless steel trim.

For adequate ventilation and air displacement, each compartment shall be properly louvered with square black heavy plastic vents.

The forward wall of the front compartments, and rearmost wall of the rear compartments, shall have removable panels, constructed from the same body material, to cover and protect all 12 volt electrical accessories mounted on the walls. The panels shall be removable to provide access to those components.

Compartment interiors shall be provided in a natural unpainted finish.

**Vision Body - Fenders and Liners**

**FENDER PANELS**

Side fender panels above the rear wheels shall be heavy duty smooth copolymer material. Each shall be painted the same color as the exterior body.

**FENDER LINERS**

Copolymer fender liners shall be welded into the wheel well area, above the rear wheels. Adequate clearance shall be provided for the installation of single tire chains. The inner liners shall be textured black copolymer material.

**No Hose Bed - Provide Treadplate Top**

**HOSE BED (NONE)**

There shall no bed present on this apparatus.

**NOTE:** The top of the "bed area" shall be covered with bright aluminum treadplate.

**NOTES**

Was priced in at $0. I added $1,892 this time (md 6-1-15).

**Vision Body - Fasteners**

**FASTENERS**
All fasteners used to mount or secure components to the body shall be of stainless steel construction. Items fastened directly into the copolymer shall use sheet metal screws, stainless steel T-nuts or threaded brass inserts, depending on application. Upon request by the department, the manufacturer shall be required to provide a sample of the fasteners to be used in the body construction.

Vision Body - Treadplate & Trim (Initial Attack)

TREADPLATE AND TRIM

All treadplate shall be bright aluminum. Any horizontal surfaces with aluminum treadplate shall be overlaid with embossed 1/8" bright aluminum treadplate. The aluminum treadplate shall meet recommended requirements for non slip surfaces.

Rubrail - Black Rubber - Initial Attack

RUBRAILS

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

NO Left Front Body Steps Required

NO LEFT FRONT BODY STEPS

There are no access steps provided on the left front body face of this apparatus.

NO Right Side Front Steps Required

NO RIGHT FRONT BODY STEPS

There are no access steps provided on the right front body face of this apparatus.

Folding Steps At Rear (6) (Three Each Side)

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.

ENG. NOTES

- Three each side.

Rear Vertical Hand Rails (2)

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.

750 Gallon Tank - Poly
750 GALLON TANK - COPOLYMER

Booster tank shall be constructed of a copolymer material, properly baffled.

The tank shall be provided with at least one (1) full length swash partition (baffle) and a sufficient number of width wise 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”.

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

Tank shall have an overflow designed to prevent damage to the tank under high flow conditions and enclosed in front tank filler. The overflow is to be designed and located to prevent water loss on fast stops or starts, and is also to be located not to affect traction on the rear tires.

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.

A fill tower shall be installed in the tank top. It shall be of adequate size, minimum 10” X 10”, to accommodate overflow and vents, to have a hinged cover and screen installed.

The tank shall be mounted to the chassis frame, per manufacturer's requirements.

---NOTE: A minimum 1” to 1-1/2” tank fill is required for tanks at 1000 gallons or less (see 13-01 section of QW in Pump Module Section) (10-31-05).

Tank Overflow - 4”

TANK OVERFLOW

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

Foam Tank - 50 Gallon Integral Poly (1)

FOAM TANK

One (1) 50 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.

Vision Body - Subframe (Initial Attack) CoPoly

SUBFRAME

The body shall be attached to and supported by a heavy duty, spring loaded, steel subframe bolted to the truck frame. The subframe shall be spring mounted to the chassis frame to allow for independent flexing of the body in relation to the chassis frame. The subframe shall be constructed from structural steel angle and C-channels. The subframe shall be completely powder coated prior to installation of the subframe on the chassis. No welding shall be allowed to the truck frame. Rubber isolator strips shall be installed at all
contact points between body and subframe.

Due to the importance of the subframe flexibility and corrosion resistance, there shall be no exception to these requirements.

**Vision Body - Fenderettes - Anodized Aluminum (Single)**

**FENDERETTES**

Bright anodized aluminum fenderettes shall be bolted to the wheel well openings.

**Tailboard**

The rear tailboard shall be bolted to a heavy duty steel support assembly attached to the chassis frame.

The rear tailboard shall NOT extend beyond the rear face of the side body compartments.

It shall be constructed of embossed fire apparatus quality bright aluminum treadplate.

**Body Side Compartments**

**COPOLYMER COMPARTMENTS**

**LEFT SIDE**

1.) One (1) compartment ahead of the left side rear wheels, approximately 28" wide x 68" high x 23" deep. The door opening shall be approximately 26" wide x 66" high.

2.) One (1) compartment over the left side rear wheels, approximately 59" wide x 48" high x 23" deep. The door opening shall be approximately 54" wide x 37" high.

3.) One (1) compartment behind the left side rear wheels, approximately 29" wide x 68" high x 23" deep. The door opening shall be approximately 27" wide x 66" high.

**RIGHT SIDE**

4.) One (1) compartment ahead of the left side rear wheels, approximately 28" wide x 68" high x 23" deep. The door opening shall be approximately 26" wide x 66" high.

5.) One (1) compartment over the left side rear wheels, approximately 59" wide x 48" high x 23" deep. The door opening shall be approximately 54" wide x 37" high.

6.) One (1) compartment behind the left side rear wheels, approximately 29" wide x 68" high x 23" deep. The door opening shall be approximately 27" wide x 66" high.

**ENG. NOTES**

--High left and high right sides.--17" ahead of rear wheels.--45" wide over wheel wells.--36" wide behind the rear wheels.--48" wide rear compartment.

**NOTES**
<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>33-07-0140</td>
<td>One (1) Rear Compartment With Roll Up Door</td>
</tr>
<tr>
<td>35-17-0202</td>
<td>One (1) Brushed Finish Roll Up Door (Rear)</td>
</tr>
<tr>
<td>35-90-5110</td>
<td>One (1) Door Lock (1) - Rear</td>
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<tr>
<td>35-02-1050</td>
<td>One (1) Roll Up Side Doors - IA005-8 Vision Attack</td>
</tr>
<tr>
<td>35-90-1170</td>
<td>One (1) Robinson Roll-Up Door Const (Vision Initial Attack)</td>
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**REAR COMPARTMENT**

7.) One (1) compartment at the apparatus rear, approximately 48” wide x 50” high x 24” deep. The door opening shall be approximately 42” wide x 46” high.

The compartment shall have a roll up door.

**REAR ROLL UP DOOR FINISH**

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

**REAR DOOR LOCK**

One (1) key lock assembly shall be provided for the rear compartment. The lock shall be integral with the door latch assembly, with keys included.

**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.

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.
One (1)  
35-17-0102  
**Brushed Finish Roll Up Doors (Side)**  

**SIDE ROLL UP DOOR FINISH**  

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

One (1)  
35-90-5160  
**Door Locks (6) - Side**  

**SIDE COMPARTMENT DOOR LOCKS**  

Six (6) side compartments shall have key lock assemblies. Each lock shall be integral with the door latch assembly, with keys included. All keys shall fit each lock.

**SHOP NOTES**  

A key lock assembly shall be provided for the following compartment doors:

---Each of the side body compartments.

**ENG. NOTES**  

-For roll doors only.-Specify which doors are to have locks.

**S** One (1)  
37-20-0570  
**Suction Troughs - Two Each Side Body**  

**HARD SUCTION TROUGHS**  

Four (4) unpainted aluminum suction troughs shall be provided above the body side compartments. There shall be two heavy duty Velcro straps installed to hold hose in a secure position.

---Two (2) on the left side body  
---Two (2) on the right side body

**ENG. NOTES**  

-Two recommended by NFPA.-Specify size of trough. Pricing for up to 10 ft x 6".-Larger and longer sizes subject to Engineering approval.

One (1)  
37-50-2400  
**Wheel Well Air Bottle Compts. (4)**  

**WHEEL WELL SCBA COMPARTMENTS**  

Four (4) wheel well air bottle compartments shall be provided and located at the rear wheel wells, two each side. Each compartment shall be a tube shaped design, fabricated from the same material as the body, and shall be properly supported to prevent cracking or breaking.

The front opening shall be seam welded to the wheel well. Each compartment shall have a drain to dispel moisture. Compartments of metal material shall be lined with black rubber to protect the finish of the air bottles.

**ENG. NOTES**  

-Be sure body style accommodates desired quantity.

Seven (7)  
**Unistrut Shelving Tracks (Each Compt)**
38-00-0200

**SHELVING TRACKS**

Unistrut type tracks shall be provided in seven (7) body compartment(s). The tracks shall be mounted vertically from floor to ceiling. A minimum of four (4) tracks shall be provided for each compartment specified.

**SHOP NOTES**

The following compartments shall have unistrut track installed:

--- Each of the side body compartments and the rear compartment.

**ENG. NOTES**

- Insert the required quantity.
- Detail the locations in Shop Notes.

S  Twelve (12) **Adjustable Shelving - Aluminum (Each)**
38-02-1100

**ADJUSTABLE SHELVING**

Twelve (12) heavy duty adjustable aluminum shelving shall be provided and installed. The sides shall be 2" high and welded to the floor and corners. The top edges shall be rounded to eliminate sharp edges.

**SHOP NOTES**

The twelve (12) shelves shall be located as follows:

- Compartment #1: Two (2) shelves
- Compartment #2: One (1) shelf
- Compartment #3: Two (2) shelves
- Compartment #4: Two (2) shelves
- Compartment #5: One (1) shelf
- Compartment #6: Two (2) shelves
- Compartment #7: Two (2) shelves

**ENG. NOTES**

- Specify location in shop notes.
- Put in desired quantity in Quantity column.

S  Four (4) **Hose Racks (Compt #1 & #4)**
38-47-9900

**HOSE RACKS**

There shall be four (4) hose racks provided for rolls of 67 ft x 3" hose with Storz couplings. It is anticipated the racks will accommodate approximately four (4) rolls of 67 ft, 3" hose each.

**NOTE:** The racks shall be mounted as follows:

--- Two (2) in compartment #1
--- Two (2) in compartment #4.

--- **PAINT, STRIPING, AND LETTERING---**
PAINT, STRIPING, AND LETTERING SECTION

Paint Finish - Vision Body (Initial Attack)

PAINT FINISH

The apparatus shall be finish painted with DuPont Chroma system paint. The compartment doors, if painted, shall be painted separately to ensure proper paint coverage on the body edges.

The apparatus shall be prepared and painted using the following procedures.

All surfaces to be painted shall be prepared and cleaned using soap and water. Prep Sol 3919S or Kwik Clean 3949S shall be used to remove any tar, wax, polish and grease.

All surfaces to be painted shall be scuffed using 80-150 grit sandpaper. All surfaces shall receive a final wipe using Lacquer and Enamel Cleaner 3939S followed up with Plastic Prep 2319S.

Two medium wet coats of adhesion promoter for Plastics 2322S shall be applied to all surfaces to be painted.

All surfaces to be painted shall be primed with URO Primer Filler 1140S. The primer mixture shall contain four (4) parts primer, one (1) part Activator 1125S, one and a half (1.5) parts Converter 1130S, and one half (.5) parts Flex Additive 2350S.

Two applications of primer shall be applied. The first application shall be four (4) coats and the second application shall be three (3) coats.

A final application of sealer shall be applied using URO Primer Filler 1140S. The sealer mixture shall contain four (4) parts primer, one (1) part Activator 1125S, two (2) parts Converter 1130S and one half (.5) Flex Additive 2350S.

The base coat shall be Dupont ChromaBase. The paint shall be applied according to DuPont base coat application instructions. The base coat shall be ChromaBase mixed with 5% Flex Additive 2350S.

The clearcoat shall be DuPont ChromaClear. The clearcoat shall be applied according to DuPont clear coat application instructions. The clear coat shall be ChromaClear Multi Use 7500S and mixed with 5% Flex Additive 2350S.

The compartment interiors shall be unpainted and in their natural white finish.

A pint of touch up paint shall be provided for each color used.

Paint Color - Match Chassis

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.

ENG. NOTES
-Make sure you have the chassis paint number and color. -Please do not reference a previous truck.-Special paint could require an upcharge.

One (1) Wheel Rims - As Provided with Chassis

WHEEL RIMS

The chassis wheels shall be as furnished by the chassis OEM. No additional finishes shall be provided by apparatus manufacturer.

One (1) (*) Reflective Striping - Pmpr/Tnkr - Single Axle

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).

ENG. NOTES
--Click the "blue box" at far left, or "right click" on this line and then "add" "browse" for additional options.

One (1) 4" Reflective Stripe

The stripe shall be a 4" wide reflective stripe

S One (1) Reflective Stripe Color - WHITE (NO Blue Shading)

The reflective stripe color shall be WHITE. NOTE: There shall be NO blue shading.

S One (1) Reflective Stripe - Angle Up On Forward Doors Then Straight Back

STRIPE DESIGN

The reflective stripe shall be applied in a straight line along each side of the cab; then angle upward on the forward body doors, then straight back on the remainder of the body.

ENG. NOTES
--This is the standard height.

S One (1) Reflective Material On Cab Door Interiors

CAB DOOR REFLECTIVE MATERIAL

There shall be reflective material installed on the lower interior portion of each cab door.

ENG. NOTES
--If not with chassis. If with chassis, use upgrade to change.--Per 2003 edition of NFPA 1901.

One (1) Reflective On Cab Door Interior (4 Door)

CAB DOOR REFLECTIVE MATERIAL

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

**Reflective Color - WHITE**

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

**Snow Dragon Logo On Cab Doors And 2 Body Doors**

**SNOW DRAGON LOGOS**

**SHOP NOTES**
There shall be Snow Dragon logos with Chinese characters installed on the forward cab doors and on the compartment doors over the body wheel wells. Refer to Beijing jobs 3009 and 3010.

**Darley Logo On Cab Hood**

**LOGO ON CAB HOOD**

**SHOP NOTES**
The Darley logo shall be applied to the cab engine hood.

**Designed For Life Logo - Rear Compartment Door**

**DESIGNED FOR LIFE**

**SHOP NOTES**
One (1) Darley "Designed For Life" logo shall be applied to the rear body compartment door.

**Emblems On Rear Cab Doors (2)**

**CUSTOMER EMBLEMS**

**SHOP NOTES**
There shall be two (2) emblems applied as follows:

---one on each of the driver side and passenger side rear cab doors. Details shall be provided by DCA.

**ENG. NOTES**
- Detail forward or crew doors in Shop Notes.

**Darley Logo And Truck Model Number At Lower Rear**

**DARLEY LOGO AND TRUCK MODEL AT LOWER REAR**

**SHOP NOTES**
---There shall be a Darley decal logo, mounted on a smooth "plate", located at the lower left rear of the apparatus body
---There shall be the truck model number, mounted on a smooth "plate", located at the lower right rear of the apparatus body.

---12 VOLT ELECTRICAL SECTION---
12 VOLT ELECTRICAL SECTION

12V & Multiplex System

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.

ENG. NOTES

_Load management system included in multiplexing.

Master & Warning Light Switches - Cab Console (Commercial)

12 VOLT SWITCHES (CENTER CONSOLE)

There shall be a rocker switch panel provided in the cab console between the driver and officer seats.

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.
ENG. NOTES

- Commercial chassis.

One (1)
50-01-0100

D.O.T. Running Lights

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.

S One (1)
50-01-0799

Amber Marker Light - Reflector Set (Ship Loose)

AMBER MARKER LIGHT - REFLECTOR SET

A set of amber marker lights (or lenses) and reflectors shall be shipped with the trucks. See Steve Schultz.

One (1)
50-01-0800

License Plate Holder & Light

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.

One (1)
50-02-2100

Tail & Back Up Lights - Whelen 64 LED

REAR DIRECTIONALS

Rear directional lighting shall be supplied as follows:

Two (2) Whelen 6" x 4" LED stop and tail lights, one each side - Red.
Two (2) Whelen 6" x 4" LED turn signals, one each side - Amber.
Two (2) Whelen 6" x 4" LED back up lights, one each side - Clear.

One (1)
50-02-5200

4 Light Bezel For Whelen Directionals

HOUSINGS FOR DIRECTIONALS

The Whelen signal lights shall each be housed in a model CAST4 cast aluminum bezel designed to hold four (4) lights each. The fourth light location shall be utilized for lower rear warning lights.

One (1)
50-05-4050

Compt LED "Strip" Lights (ROM) (Roll Doors) Wildland PolyPak

COMPARTMENT LIGHTING (LED)

Each body compartment shall contain one (1) LED 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 height 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.

One (1)

Door Open Switch and Warning Light - Roll Up Doors

DALIANSN-0001

07/17/15
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.

**Do Not Move Apparatus** Light in Cab LED

"DO NOT MOVE APPARATUS" LIGHT (LED)

A flashing red LED 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 is not in the park position.

**Warning Lights (Initial Attack)**

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

**LIGHT BAR**

Zone A - (Upper Front) - One (1) Whelen FN60VLED 60" LED light bar system shall be supplied and installed.

Clear warning lights shall be shut down with the parking braking for "Blocking Right-Of -Way" mode.

Whelen - Light Bar - Mounted on Cab Roof

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

One (1) Whelen - Light Bar - Red/Clear

The colors shall be as follows:

Driver’s Side of Lightbar - Red, Officer’ Side of Lightbar - Red Two Center Front Sections of Lightbar - Clear

Whelen - Lower A - (2) 400 Series LED - Front Cab

Zone A (Lower Front) - Two (2) Whelen 400 series LED warning lights shall be mounted, one each side, on the front face of the cab or cab grille.

Whelen - Lower Zones A - Color - BLUE

The color shall be as follows:

Driver’s Side - BLUE Officer’s Side - BLUE

Whelen - Lower Zones B & D - 400 Series LED (4)

Zone B (Right Side-Lower) - Two (2) Whelen 400 series LED warning lights, approximately 3" high x 5" long, shall be mounted at the lower front side corner, and rear side corners of the apparatus.

Zone D (Left Side-Lower) - Two (2) Whelen 400 series LED warning lights, approximately 3" high x 5" long, shall be mounted at the lower front side corner, and rear side corners of the apparatus.

Whelen - Lower Zones B & D - Color - Red - (4)
The color shall be as follows:

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

**S One (1) Whelen - Upper Zone C - (2) LED Beacons**

**Zone C (Rear-Upper)** - Two (2) Whelen L31HBFN LED beacons shall be mounted, one each side, at the upper rear corners of the apparatus.

**S One (1) Whelen - Upper Zones C - Color - BLUE**

The color shall be as follows:

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

**S One (1) Whelen Lower Rear Fog Lights**

**Zone C (Rear-Lower)** - Two (2) 600 series LED FOG LIGHTS shall be mounted, one each side, at the lower rear of the apparatus (in the four light bezels).

**NOTE:** These lights shall be switched with the front cab fog lights.

**S One (1) Whelen - Lower Zones C - Color - RED (2)**

The color shall be as follows:

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

**One (1) Whelen Siren #295SLSA1**

**SIREN**

One (1) Whelen electronic siren, model # 295SLSA1 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.

**Mounting Location - Recessed In Center Console**

The electronic siren control shall be recessed in center console between driver and officer seats.

**Siren Speaker - Bumper (100W) (1)**

**SIREN SPEAKER**

One (1) siren speaker, with a 100 watt driver shall be provided and installed at the front bumper.

**ENG. NOTES**

-Engineering to choose model & brand for best application.

**Siren Speaker - Recessed In Center of Bumper**

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

**(*) 12 VOLT TELE-LIGHTS (Wildland)**
12 VOLT TELESCOPING LIGHTING

ENG. NOTES
-Click the "blue box", or hit "insert", or right click then click "add" & "browse" for options.

S Two (2)
59-10-3550

FRC 12V Evolution LED Bottom Raise Tele Light(s)

TELESCOPIC LED FLOODLIGHTS

Two (2) Fire Research Evolution LED model FCA530-V15 side mount push up telescopic lights shall be installed. Each light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 3 1/2" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

Each lamphead shall have eight (8) ultra-bright white LEDs. It shall operate at 12/24 volts DC, draw 13/6.5 amps, and generate 15,000 lumens. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall incorporate heat-dissipating fins and be no more than 5 3/16" deep by 3 5/16" high by 11 1/2" wide. The lamphead and mounting arm shall be powder coated white. The floodlight shall be for fire service use.

Two (2) Located On Front Body

LIGHT LOCATION

The light(s) shall be mounted on the front face of the body.

Two (2) Remote Light Switch - In Cab & Pump Panel

LIGHT SWITCHING

Two (2) remote 12 volt weather resistant switch(es) shall be provided and installed at the pump operator's panel and inside the cab for the specified light(s). Each switch shall be properly labeled to indicate the light it controls.

ENG. NOTES
-Change quantity to match number of lights to be switched.

One (1) Equipment to be Supplied

70-00-0050
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.

S One (1) Bag Of Fasteners
70-00-0055
One (1) bag of fasteners, typically included on trucks of this design for China, containing a variety of fasteners used in the construction of this vehicle, shall be supplied with this completed apparatus.

S One (1) Aeries Manual Monitor With 3488 And 2499
70-00-0099
One (1) Akron 3425 Aeries manual deck gun with a 3488 pipe, and 2499 tips.

S Four (4) 6" x 7 ft Suction hose
70-00-1900
Four (4) section(s) of 7 ft. x 6" clear Kochek or equal suction hose, with pyrolite, NST 6" couplings shall be provided.

S One (1) 6" Barrel Strainer (AM107)
70-00-2900
One (1) 6" aluminum barrel strainer(s) (Darley catalog #AM107).

S One (1) Fire Extinguisher (5 lb) (Darley AF553)
70-01-8900
One (1) fire extinguisher(s) - 5 lb (Darley catalog #AF553).

S One (1) AF78906 Suction Samese (2) 2 .5" F x 6" F
70-02-1900
One (1) Suction siamese (2) 2 .5" F x 6" F (AF78906).

S One (1) Axe - 6lb Fiberglass Flat Head (Each)
75-08-1000
One (1) 6 lb steel head axe(s) with a fiberglass handle shall be provided.

S One (1) Axe - 6lb Fiberglass Pick Head Axe (Each)
75-08-1500
One (1) 6 lb steel pick head axe(s) with a fiberglass handle shall be provided.

Two (2) Bracket - Axe (Each Set)
75-08-2000
Two (2) set(s) of chrome plated axe blade bracket(s) and handle clamp(s) shall be provided.

ENG. NOTES

Ship Loose Price (md 9-8-06).

S Two (2) Touch Up Paint
77-22-9900
Two (2) bottles of touch up paint as used on the exterior body shall be provided.

S Two (2) Double Wheel chock BE288 on Darley Catalog
77-25-1000
Two (2) Darley BE287 wheel chocks shall be provided.

S One (1) Spare Parts (NONE)
81-10-4009
SPARE PARTS (NONE): There are NO spare parts specified for this apparatus.

S One (1) Purchaser Responsibility
99-99-1100
PURCHASER RESPONSIBILITY

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