

Memo



To: Board of Public Works & Safety

From: Todd Burtron, Fire Chief

CC: File

Date: 9/24/2012

Re: Request to Purchase

Attached you will find a specification and purchase contract for a replacement fire truck. The sales contract of 2010 affords the City the same base pricing for future purchase with the manufacturer, Kovatch Mobile Equipment (KME).

The total price for the apparatus, with the addendum attached, is \$544,583.00. Proceeds from the sale of two fire trucks earlier this year, summed at \$220,000, will be used to offset the total cost of this purchase leaving a financed balance of \$324,583.00.

This new apparatus will be used as a frontline multi-functional fire truck. This will allow the department, currently operating without a reserve fire engine, to place a 2004 pumper in reserve status to be used when other frontline trucks require maintenance and/or repair.

ADDENDUM NO. 1 TO
AGREEMENT OF SALE FOR FIRE APPARATUS
KOVATCH MOBILE EQUIPMENT CORP. D/B/A/ KME FIRE APPARATUS

THIS ADDENDUM NO. 1 (“Addendum No. 1”) to the Agreement of Sale for Fire Apparatus (“Agreement”), originally made and entered into on June 7, 2010, is made by and between KOVATCH MOBILE EQUIPMENT CORP. D/B/A/ KME FIRE APPARATUS (“Company”) and the CITY OF WESTFIELD, INDIANA (“CITY”), through their duly authorized and undersigned officials.

WITNESSETH

WHEREAS, the City previously purchased certain fire equipment apparatus from Company pursuant to the Agreement; and

WHEREAS, the Section 15 of the Agreement contemplates and provides for the City purchasing additional apparatus from Company off of the Agreement, subject to mutual agreement of the parties and certain adjustments; and

WHEREAS, the City now desires to purchase additional apparatus from the Company, based on the original Agreement but subject only to the revisions and amendments made thereto in this Addendum No. 1.

IT IS THEREFORE AGREED TO BY AND BETWEEN COMPANY and the CITY:

1. This Agreement is hereby amended and modified, pursuant to Section 9 and 15 of the Agreement, to provide for the purchase of the apparatus more specifically described in the Specifications attached hereto as Exhibit A - 2012 (“Apparatus”), subject only to the following modifications to the Agreement:
 - a. Section 2 Delivery Schedule: The Apparatus shall be ready for delivery approximately 240 – 270 days after receipt of the Addendum No. 1 and completion of the pre-construction meeting (to be held within a month of the order) at Company’s office headquarters in Nesquehoning, PA. The Apparatus shall be delivered to the City at Fire Department Headquarters.
 - b. Section 3. Price: The City shall pay to the Company for the Apparatus the purchase price of \$544,583.00.
 - c. Section 4. Payment: The Purchase Price shall be due in full upon delivery and passage of acceptance testing by the City.
 - d. Exhibits: Exhibits A and B to the agreement are hereby deleted in their entirety for this Addendum No. 1 and replaced with the Specifications for the Apparatus set forth in Exhibit A – 2012 attached hereto.
2. All provisions of the original Agreement not modified by this Addendum No. 1 shall remain in full force and effect.
3. This Addendum No. 1 shall become effective upon the date it is approved and signed by the last party hereto to execute it.

IN WITNESS WHEREOF, the City and Company have caused this Addendum No. 1 to be executed by their duly authorized representatives this _____ day of September, 2012.

CITY OF WESTFIELD, INDIANA

By: _____

Title: _____

Sales Representative: _____

Organization Name: _____

By: _____

Title: _____

This Addendum No. 1 is not a valid binding obligation until approved and executed by Kovatch Mobile Equipment Corp., Nesquehoning, Pennsylvania.

ACCEPTED AND APPROVED BY KOVATCH MOBILE EQUIPMENT CORP.:

By: _____

Title: _____

Date: _____



Please visit us on the web at www.donleysafety.com

5546 Elmwood Ct.
Indianapolis, IN 46203

Phone 317-786-2268
Fax 317-786-2532

September 24, 2012

City of Westfield Fire Department
17535 Dartown Rd.
Westfield, IN 46074

RE: **PRICE RECONCILIATION TO ORIGINAL PUMPER**

Dear Chief,

I am sure you might have had a little surprise at the price of the pumper over the one you received 18 -24 months ago. I wanted to explain some of the differences. Basically the differences came in the following areas:

1. KME has had two annual price increases since the time of your first order
2. You received one of the very last of the EPA 2007 Compliant Engines on your last pumper.
3. Several items have been added over your last two purchases that were not part of the original bid on the first pumper that have been added to the price of this new one.

Here is a summary of how we get to the new price:

Original Price		\$482,980
2010 Price increase 3%		\$497,469
2011 Price Increase 3%		\$512,393
EPA Engine Increase	\$15,034	\$527,427
Radio	\$5,400	\$532,827
Lettering	\$3,500	\$536,327
4 Front	\$4,700	\$541,027
Air Ride Seat - Officer	\$1,800	\$542,827
Streamlights	\$1,100	\$543,927

Cab Dash Console Ext.	\$469	\$544,396
Lock and Load Hose Bed Cover	\$1,100	\$545,496
TFT Ball Valves	\$2,200	\$547,696
Signboard in Windshield	\$550	<u>\$548,246</u>

As you can see, these addition are actually higher than the proposed price of **\$544,583**. Both Donley and KME appreciate the business Westfield has entrusted us with in both your new pumper and aerial. Additional discounting by us brought the price down to the proposed price.

I am available to discuss this at any time the department chooses.

Thank you very much for your consideration.

Sincerely,

Mike Smith

Mike Smith
President



Please visit us on the web at www.donleysafety.com

5546 Elmwood Ct.
Indianapolis, IN 46203

Phone 317-786-2268
Fax 317-786-2532

September 19, 2012

Chief Todd Burtron
City of Westfield Fire Department
17535 Dartown Rd.
Westfield, IN 46074

RE: New Pumper Proposal

Dear Chief,

Donley Safety is please to propose a new pumper as per the attached specifications.to tag-on to your existing contract. Please spend time to review the proposal to ensure everything the department wishes is included in this specification. Any additions will be in addition to the proposed price of \$544,583.00 (FIVE HUNDRED FORTY FOUR THOUSAND, FIVE HUNDRED EIGHTY THREE DOLLARS AND 00/100 CENTS).

This is the price based on the specifications attached any changes or additions can be taken at standard cost. While lettering in not listed in the specification, the 'Z' Stripe and lettering identical to your last Engine is included in the price.

Since this is a tag-on to your existing pumper contract from 2010, we do not need to execute a new contract. If your attorney can review the prior contract and advise us as to how he wishes to execute the additional pumper, we can use that agreement.

I am available to discuss this at any time the department chooses.

Thank you very much for your consideration.

Sincerely,

A handwritten signature in black ink that reads 'Mike Smith'. The signature is written in a cursive style with a large, looped 'M' and 'S'.

Mike Smith



KME FIRE APPARATUS

By Kovatch Mobile Equipment Corp.

One Industrial Complex – Nesquehoning, PA 18240
(570) 669-5132 [Phone] - (570) 669-5124 [Fax]
www.kovatch.com URL

AGREEMENT OF SALE FOR FIRE APPARATUS

THIS AGREEMENT is made between Kovatch Mobile Equipment Corp., t/a KME Fire Apparatus, of One Industrial Complex, Nesquehoning, Pennsylvania ("Company"), and:

City of Westfield Fire Department
(Legal Name of Buyer)

17535 Dartown Rd., Westfield, Hamilton, County, Indiana, 46074
(Address, City, County, State, Zip)

317-804-3333
(Buyer Phone Number)

BUYER INFORMATION (check one):

Municipal Corporation Non-Profit Corporation

Business Corporation Sole Proprietorship

Other (specify) _____

State of Incorporation: _____ Date of Incorporation: _____

1. ACCEPTANCE: Company agrees to sell and Buyer agrees to purchase the fire apparatus ("Apparatus") described in the Specifications incorporated as Exhibit A of this contract, as may be amended in writing, and the equipment listed herein, all in accordance with the terms and conditions set forth herein. Further more Company agrees to provide fire apparatus pursuant to the " Bidders Clarification" dated 08/13/08, from Company's agent, Donley Safety, set forth on Exhibit B attached hereto.

2. DELIVERY/SCHEDULE: The Apparatus shall be ready for delivery F.O.B. at 270 Calendar days after receipt of receipt of signed pre-con letter, subject to extension due to changes made by Buyer or in accordance with Sections 5 or 12 below. COMPANY and BUYER agree that time is of the essence in the performance of this Agreement and of each of its covenants and conditions.

3. PRICE: Buyer shall pay to Company as the Purchase Price for the Apparatus the sum of Four Hundred Eighty Two and Nine Hundred Eighty and No/100 U.S. Dollars (\$482,980.00). This purchase price includes the following taxes: None, Tax-Exempt Purchase.

Any applicable taxes not specifically noted above will be paid by the Buyer directly, or will be added to the Purchase Price and paid by Company. If Buyer claims exemption from any tax, Buyer agrees to promptly furnish the applicable exemption certificate(s) and to indemnify and save Company harmless from any such tax, interest or penalty, which may at any time be assessed against Company as a result of this transaction.

4. TERMS OF PAYMENT: Terms of payment shall be:

- | | | |
|--|--------------|-----|
| (A) Due upon signing | \$ _____ | -0- |
| Due upon completion/receipt of chassis | \$ _____ | -0- |
| Due upon delivery and acceptance | \$482,980.00 | |

(B) Check applicable method of payment for remaining balance due:

- Cash/cash equivalent at time of delivery
- Installment Sales Contract - Financing*
- Lease-Purchase Agreement - Financing*

* Lender/Leasing Company: _____

(C) No payment of any amount due under this Agreement shall be made directly to a KME Sales Representative without prior written approval from Company.

5. CONTINGENCIES: Company will not be liable for any delay, failure to make delivery, or other default due to strikes or labor unrest, war, riot, federal, state or local government action, fire, flood or other disaster or acts of God, lack of or inability to obtain materials, parts or supplies, or any other causes or circumstances beyond the reasonable control of Company which prevent or hinder Company's manufacture and/or delivery of the Apparatus.

6. WARRANTY: Company provides a limited warranty on new Apparatus of its own manufacture in accordance with the warranty terms set forth in the Specifications.

EXCEPT TO THE EXTENT PROHIBITED BY LAW, COMPANY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE HEREOF.

SEE SEPARATE WARRANTY STATEMENT(S) FOR COMPLETE INFORMATION.

7. DISCLAIMER OF CONSEQUENTIAL DAMAGES: COMPANY EXPRESSLY DISCLAIMS ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES WHICH MAY BE SUSTAINED BY BUYER, INCLUDING, BUT NOT LIMITED TO, THOSE ARISING FROM THE USE, INABILITY TO USE, MAINTENANCE OR REPAIR OF THE APPARATUS, WHETHER UNDER THEORIES OF BREACH OF EXPRESS OR IMPLIED WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE.

8. CANCELLATION: This contract is not subject to cancellation by Buyer, unless for material breach by Company, except upon payment to Company of a reasonable cancellation charge, which charge shall consist of expenses already incurred and non-cancelable commitments made by Company as of the date of cancellation, plus 5% for profit; provided, however, that in no event will the total of the cancellation charges plus profit exceed the Purchase Price.

9. ENTIRE AGREEMENT; AMENDMENTS: This Agreement, including its exhibits, appendices, and warranty statement, embodies the entire understanding between the parties relating to the subject matter contained herein and merges all prior discussions and agreements between them. No agent or representative of Company has authority to make any representations, statements, warranties or agreements not herein expressed. All modifications or amendments of this contract, including the exhibits, appendices, and warranty statement and Change Orders, must be in writing signed by an authorized representative of each of the parties hereto.

10. SEVERABILITY: If any provision hereof shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision, and this contract shall be construed as if the invalid, illegal or unenforceable provision had never been contained in it, unless to do so clearly negates the overall intent or purpose of the parties in entering into this Agreement.

11. CHANGES IN COMMERCIAL SPECIFICATIONS: Specifications for all commercial components of the Apparatus, manufactured by companies other than KME, are subject to change but only upon prior notice to Buyer. Specifications for such components will be as available at the time of manufacture of the Apparatus. Company shall not be liable for any specification deviations from the original contract specifications on such components made by their original manufacturer.

12. CHANGES IN REGULATIONS/INDUSTRY STANDARDS: The Purchase Price is subject to adjustment for changes to the Apparatus necessitated by changes in applicable government regulations (such as FMVSS or emissions regulations), industry standards (such as NFPA standards), replacement of discontinued models or components from vendors, or freight charges. Buyer is responsible for any cost increases due to such changes beyond Company's control.

13. EXPLANATION OF CONTRACT AMOUNT:

BASE BID PRICE: \$482,980.00

14. GOVERNING LAW: This Agreement is governed by the laws of the State of Pennsylvania.

15. Extension Clause. Pending mutual agreement between Buyer and Company, the Buyer, in its sole discretion, may purchase additional Apparatus and equipment off of this contract for ten (10) years, but is not required and/or legally obligated to do so. The Company shall not substitute a brand of Apparatus different from the bid of the Buyer. The Company shall be responsible for advising the Buyer of any upgrades, improvements, or engineering changes made to the Apparatus as agreed upon in this contract. The purchase price may be subject to any supplier price increases caused by GSA, EPA, NPA,

DOT, or spot market prices of aluminum or other raw materials. Normal cost adjustments for inflation may also apply.

16. Tag-on Clause. Any interested Fire Department, Government Agency, or Emergency Medical Service provider may purchase Apparatus off of this contract, for the duration of this contract not to exceed 10 years. Any changes to Apparatus purchased off this contract must be made with the approval of the Company.

IN WITNESS WHEREOF, Buyer and Company have caused this Agreement to be executed by their duly authorized representatives this 7th day of JUNE, 2010.

City of Westfield IN
(Buyer's Legal Name)

Signature: [Handwritten Signature]

Print: Chief Todd Burtron

Title: Chief, Westfield Fire Department

Date: June 7, 2010

Sales Representative's Signature: Michael Smith

Printed: MICHAEL SMITH

Organization Name: DONLEY SAFETY

Title: PRESIDENT

Date: 6/7/2010

This contract is not a valid and binding obligation until approved, dated and executed by Kovatch Mobile Equipment Corp., Nesquehoning, Pennsylvania.

ACCEPTED AND APPROVED BY KOVATCH MOBILE EQUIPMENT CORP.:

By: [Handwritten Signature]

Printed: Dir. of Sales - Paul J. Goren

Title: _____

Date: 6/11/10

FEDERAL EXCISE TAX EXEMPTION CERTIFICATE

(For use by United States, Territories, District of Columbia, or Political subdivisions.)

Date: June 7, 2010

The undersigned hereby certifies that he is:

Chief Todd Burtron of the Westfield Fire Department
(Title of Officer) (United States, States, Territory, District of Columbia or Political Subdivision)

and that he is authorized to execute this certificate and that the article or articles specified in the accompanying order or on the reverse side hereof are purchased from Kovatch Mobile Equipment Corporation, for the exclusive use of

City of Westfield, Hamilton County, Indiana
(United States, States, Territory, District of Columbia, or political subdivision)

It is understood that the exemption from tax in the case of sales or articles under this exemption certificate to the United States, States, etc. is limited to the sale of articles purchased for their exclusive use; and it is agreed that, if articles purchased tax free under exemption certificates are used otherwise, or are sold to employees or others, such fact must be reported to the Federal Tax Office of the article or articles covered by this certificate. It is also understood that the fraudulent use of this certificate to secure exemption will subject the undersigned and all guilty parties to a fine of not more than \$10,000.00 or to imprisonment for not more than five years, or both, together with costs or prosecution.

City of Westfield, Hamilton County, Indiana
(Name of Organization)

By: Todd Burtron Fire Chief (Signature)

SALES OR USE TAX EXEMPTION CERTIFICATE

Name of Buyer: City of Westfield Fire Department, Indiana

Address: 17535 Dartown Rd., Westfield Indiana 46074
City State Zip

The above named business, holder of the following State permit number

Number 35-111142 State 0019312100
certifies that all tangible property purchased from Kovatch Mobile Equipment Corporation, Nesquehoning, Pennsylvania, is exempt from Sales of Use Tax for reasons(s) checked below:

- Resale as tangible personal property
- Governmental Unit or Instrumentality
- Non or Charitable Unit
- Other (Explain Fully)

Signature Todd Burtron Title Fire Chief
Date Jun 7 2010

Federal Excise Tax and State Sales Tax will be added if the above form is not completed and signed.



Predator Custom Pumper

ATTACHMENT A SPECIFICATIONS

for the

Westfield Fire Department

June 26, 2012

Contents

GENERAL INFORMATION.....	9
"TOP OF THE LINE" CHASSIS	9
GENERAL CONSTRUCTION.....	9
SINGLE-LINE RESPONSIBILITY	10
PRODUCT LIABILITY INSURANCE.....	10
SERVICE CENTER AND PARTS DEPOT.....	10
PRICES AND PAYMENTS.....	10
DELIVERY TIME	10
FAIR, ETHICAL AND LEGAL COMPETITION.....	10
MATERIAL AND WORKMANSHIP	11
SALES ENGINEER.....	11
APPROVAL DRAWING	11
INSPECTION VISITS.....	11
INSTRUCTION MANUALS/DRAWINGS, SCHEMATIC.....	11
"AS BUILT" WIRING SCHEMATICS.....	12
CONTINGENCY FUND.....	12
U.S.A. MANUFACTURER.....	12
QUALITY MANAGEMENT	12
TABLE OF CONTENTS.....	12
COOPERATIVE PURCHASING	12
GENERAL APPARATUS DESCRIPTION "PUMPER".....	12
CAB SAFETY SIGNS.....	13
CHASSIS DATA LABELS	13
ROLLOVER STABILITY.....	14
OPEN SPACE DESIGN	14
CAB MATERIAL.....	16
CAB - BASE CONSTRUCTION.....	16
CRASH TESTING CERTIFICATION	16
ROOF AND SIDE LOAD TESTING	16
DIMENSIONS - EXTENDED LONG FOUR DOOR STYLE CAB.....	17
CAB ROOF.....	18
CAB DOORS.....	18
ENTRY STEP AREA.....	18
AUXILIARY CAB STEPS	19
AUXILIARY CAB STEPS	19
DOOR LATCHES.....	19
KEYLESS ENTRY SYSTEM	20
DOOR WINDOWS.....	20
INNER DOOR PANELS	20
CAB DOOR FRAME AND JAMB SCUFF PLATES	20
EXTERIOR CAB WALL OVERLAY.....	20
TRANSVERSE EXTERIOR CAB COMPARTMENTS	20
WINDSHIELD/GLASS.....	21
DARK TINTED REAR WINDOW GLASS.....	22
GRAB HANDLES	22
INTERIOR GRAB RAILS.....	22
FRONT CAB GRILL.....	22
AIR INTAKE/OUTLET	23
FRONT MUD FLAPS	24
INTERIOR CAB TRIM.....	25
INTERIOR REAR WALL.....	25

UNDER SEAT STORAGE COMPARTMENTS.....	25
BARYFOL FLOORING.....	26
ENGINE ENCLOSURE.....	26
SUN VISORS.....	26
ADVANCED OCCUPANT RESTRAINT SYSTEM.....	26
ROLL SENSOR.....	27
DRIVERS SEAT.....	27
OFFICERS SEAT.....	27
DELETE REAR FACING, OUTBOARD, DRIVER SIDE SEAT.....	28
DELETE REAR FACING, OUTBOARD, OFFICER SIDE SEAT.....	28
FORWARD FACING, OUTBOARD, OFFICER SIDE SEAT.....	28
CENTER FORWARD FACING CREW SEATS.....	28
FORWARD FACING CREW SEAT RISER.....	29
SEAT UPHOLSTERY MATERIAL.....	29
PADDED SCBA OPENING COVERS.....	29
SEAT BELT CUSHION SENSORS AND BELT SENSORS.....	29
VEHICLE DATA RECORDER.....	29
INTERIOR CAB STORAGE COMPARTMENT.....	30
INTERIOR CAB STORAGE COMPARTMENTS.....	30
CAB DOGHOUSE STORAGE MODULE.....	31
CAB INTERIOR COMPARTMENT.....	31
ANTENNA INSTALLATION.....	31
LAPTOP COMPUTER SLIDE OUT TRAY.....	32
DASH & CENTER CONSOLE.....	32
DRIVERS DASHBOARD PANEL.....	33
WELDON V-MUX DISPLAY.....	33
ADDITIONAL WELDON V-MUX DISPLAY ON OFFICER SIDE OF CAB.....	33
INDICATOR CLUSTER.....	33
CENTER DASH EXTENSION/STORAGE MODULE.....	36
LOWER LEFT AUXILIARY SWITCH PANEL.....	36
PUMP SHIFT CONTROL.....	37
OFFICER DASH.....	37
COMPUTER MOUNT.....	37
CENTER OVERHEAD PANEL.....	37
CLIMATE CONTROL SYSTEM.....	37
ROOF MOUNT CONDENSER.....	38
CLIMATE CONTROL SWITCHES.....	39
CAB TILT ASSEMBLY.....	39
AUXILIARY MANUAL CAB LIFT.....	39
AUDIBLE ALARM (CAB TILT).....	40
CHASSIS FRAME ASSEMBLY.....	40
FRONT BUMPER.....	40
STORAGE WELL - CENTER.....	40
CORNERING LIGHTS.....	41
FRONT TOW EYES.....	41
FRONT AXLE.....	41
FRONT DISC BRAKES.....	41
FRONT SUSPENSION.....	41
FRONT SHOCK ABSORBERS.....	41
REAR AXLE.....	41
REAR BRAKES.....	41
REAR AXLE TOP SPEED.....	42
REAR SUSPENSION.....	42
BRAKE SYSTEM.....	42
ABS SYSTEM.....	42
BRAKE AIR RESERVOIRS.....	43

AIR DRYER	43
AIR LINES	43
AIR COMPRESSOR	43
BRAKE TREADLE VALVE	44
PARKING BRAKE	44
AUXILIARY AIR INLET/AUTO EJECT	44
FRONT WHEELS & TIRES	44
REAR WHEELS & TIRES	45
TIRE PRESSURE MONITORING DEVICES	45
ENGINE BASE WARRANTY	46
ENGINE CHASSIS CERTIFICATION	46
COOLING/RADIATOR	46
The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system standards.	46
TRANSMISSION COOLER.....	47
A shell and tube transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature. The cooler shall have an aluminum shell and copper tubes. The cooler shall be assembled using pressed in rubber tube sheets to mechanically create a reliable seal between the coolant and the oil. No brazed, soldered, or welded connections shall be used to separate the coolant from the oil.	47
RADIATOR SKID PLATE	47
CHARGE AIR COOLER	47
COOLING SYSTEM FAN.....	47
COOLANT HOSE AND PIPING	48
HEATER HOSES	48
LOW COOLANT INDICATOR LIGHT AND ALARM.....	48
ENGINE BRAKE	48
ENGINE FAST IDLE	48
AIR CLEANER	49
SPARK ARRESTOR	49
ACCELERATOR CONTROL.....	49
REMOTE THROTTLE CONTROL HARNESS.....	49
TRANSMISSION	49
TRANSMISSION OIL LEVEL SENSOR.....	50
PARK TO NEUTRAL.....	50
PRESELECT PROGRAMMING	50
TRANSMISSION FLUID.....	50
DRIVE LINES	50
DIESEL EXHAUST FLUID TANK	50
EXHAUST SYSTEM.....	51
SELECTIVE CATALYTIC REDUCTION (SCR)	51
FUEL TANK.....	51
FUEL TANK STRAPS	52
FUEL FILTER/WATER SEPARATOR	52
SECONDARY ELECTRIC FUEL PUMP	52
FUEL POCKET	52
DUAL POWER STEERING.....	52
CHASSIS ELECTRICAL SYSTEM.....	56
WIRING HARNESS DESCRIPTION.....	56
DIRECT GROUNDING STRAPS	57
EMI/RFI PROTECTION	57
12 VOLT ELECTRICAL SYSTEM TESTING	57
TEST #1-RESERVE CAPACITY TEST	57
TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE.....	57
TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD.....	58
LOW VOLTAGE ALARM TEST	58



ATTACHMENT A SPECS

MULTIPLEX ELECTRICAL SYSTEM WITH COLOR DISPLAY	58
ADDITIONAL WELDON V-MUX DISPLAY ON OFFICER SIDE OF CAB	59
V-MUX REAR & SIDE VISION CAMERAS	59
MODEM TRANSCEIVER	59
INTERLOCK INTERFACE MODULE	59
VOLTAGE MONITOR SYSTEM	60
INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM.....	60
12 VOLT SEQUENCER	60
ELECTRICAL HARNESS REQUIREMENT	61
BATTERY CABLE INSTALLATION	62
ALTERNATOR	62
BATTERY SYSTEM.....	62
BATTERY STORAGE	62
BATTERY BOX COVER	63
BATTERY DISCONNECT SWITCH	63
BATTERY JUMPER STUDS.....	63
120 VOLT SHORELINE CONNECTION - "SUPER 30" AUTO EJECT	63
SHORELINE POWER INLET PLATE	63
BATTERY INVERTER/CHARGER SYSTEM.....	64
OUTLET STRIP	64
"LED" CAB INTERIOR LIGHTING	64
CAB MAP LIGHT.....	64
HAND HELD SPOTLIGHT	64
"DO NOT MOVE APPARATUS" WARNING LIGHT WITH AUDIBLE ALARM.....	64
12 VOLT POWER PORT	65
12 VOLT ACCESSORY CIRCUIT - CAB DASH	65
12 VOLT ACCESSORY CIRCUIT - CREW CAB AREA	65
ASA VOYAGER DUAL CAMERA SYSTEM.....	65
HEADLIGHTS CLUSTER	65
DAYTIME RUNNING LIGHTS	66
SECONDARY DUAL LIGHT MODULE	66
DOT MARKER LIGHTS AND REFLECTORS	66
DOT MARKER LIGHTS AND REFLECTORS	66
LICENSE PLATE LIGHT - REAR.....	66
TAIL, STOP, TURN AND BACK-UP LIGHTS	66
LED THIRD BRAKE LIGHT	67
CAB STEP LIGHTS.....	67
BODY STEP LIGHTS.....	67
DUNNAGE AREA LIGHTING	67
SCENE LIGHTS - REAR OF BODY.....	67
SCENE LIGHTS - BEHIND FRONT CAB DOORS.....	68
CAB SCENE LIGHTS - ADDITIONAL ACTIVATION.....	69
REAR SCENE LIGHTS - ADDITIONAL ACTIVATION	69
GROUND LIGHTS - CAB.....	69
ROOF MOUNT 215W LED BROW LIGHT - ABOVE WINDSHIELD	69
ROOF MOUNT 215W LED BROW LIGHT - ABOVE WINDSHIELD	69
LIGHTS ABOVE WINDSHIELD MASTER POWER SWITCH.....	70
LIGHTS AT FRONT DOOR RADIUS MASTER POWER SWITCH	70
12 VOLT BODY ELECTRICAL SYSTEM.....	70
BODY ELECTRICAL JUNCTION COMPARTMENT	70
PUMP ENCLOSURE WORK LIGHTS	70
ENGINE COMPARTMENT WORK LIGHTS.....	70
AMDOR LUMA BAR TRACK MOUNTED COMPARTMENT LIGHTS - LED	71
DRIVER SIDE ROOF COMPARTMENT LIGHTING	71
OFFICER SIDE ROOF COMPARTMENT LIGHTING	71
NFPA AUDIBLE AND LIGHTING WARNING PACKAGE.....	71



ATTACHMENT A SPECS

LIGHT PACKAGE ACTUATION CONTROLS	71
UPPER LEVEL LIGHTING - WHELEN.....	71
NFPA ZONE A, UPPER.....	71
NFPA ZONE C, UPPER.....	72
NFPA ZONES B & D REAR, UPPER.....	72
NFPA ZONES B & D FRONT, UPPER.....	72
LOWER LEVEL LIGHTING - WHELEN.....	72
NFPA ZONE A, LOWER.....	72
NFPA ZONE C, LOWER.....	72
NFPA ZONES B & D FRONT, LOWER.....	72
NFPA ZONES B & D MIDSHIP, LOWER.....	72
NFPA ZONES B & D REAR, LOWER.....	72
WARNING LIGHT SYSTEM CERTIFICATION.....	73
ALTERNATING FLASHING HEADLIGHT SYSTEM.....	73
ROOF MOUNTED LIGHT BARS	73
TRAFFIC ADVISER WARNING LIGHT	73
ELECTRIC HORN.....	73
BACK-UP ALARM.....	73
AIR HORNS	73
ELECTRONIC SIREN.....	74
FEDERAL Q2B MECHANICAL SIREN.....	74
FIRECOM MODEL #3010R INTERCOM SYSTEM.....	75
DRIVERS AND OFFICERS HEADSETS & BASE STATION FOR WIRELESS FIRECOM SYSTEM.....	75
RADIO INTERFACE CABLE.....	76
REAR JUMPSEAT HEADSETS.....	76
WEATHER BAND AM/FM/CD RADIO.....	76
PUMP.....	76
PUMP CONSTRUCTION.....	77
IMPELLER SHAFT.....	77
PUMP PACKING.....	77
PUMP IMPELLER.....	77
PUMP TRANSMISSION.....	77
PUMP RATIO.....	78
PUMP SHIFT.....	78
EMERGENCY PUMP SHIFT	78
PUMP SHIFT INDICATORS LIGHT.....	78
TRANSMISSION LOCK	78
BRAKING SYSTEM	78
MAIN PUMP MOUNTS	78
PRESSURE RELIEF VALVE	79
INTAKE RELIEF VALVE	79
PUMP CERTIFICATION	79
PRIMING PUMP.....	79
MASTER DRAIN	79
INDIVIDUAL BLEEDERS AND DRAINS.....	79
SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES.....	80
ANODE BLOCKS.....	80
PUMP OVERHEAT INDICATOR SYSTEM	80
TOP MOUNT PUMP MODULE.....	80
TOP MOUNTED VALVE CONTROLS.....	80
DUNNAGE AREA.....	81
TRANSVERSE WALKWAY	81
SUCTION INLETS	81
PUMP SUCTION ENDS.....	81
FRONT SUCTION.....	81
TANK TO PUMP	83



ATTACHMENT A SPECS

TANK FILL.....	83
DRIVER'S SIDE MAIN DISCHARGE #1	83
DRIVER'S SIDE MAIN DISCHARGE #3.....	84
OFFICER'S SIDE MAIN DISCHARGE #1.....	85
OFFICER'S SIDE MAIN DISCHARGE #2.....	85
DRIVER SIDE REAR DISCHARGE	86
OFFICER SIDE REAR DISCHARGE	87
DECK GUN DISCHARGE	87
TFT MANUAL DECK GUN.....	89
FRONT DISCHARGE	89
HORIZONTAL CROSSLAY #1.....	90
HORIZONTAL CROSSLAY #2.....	90
HORIZONTAL SPEEDLAY #1	91
SPEEDLAY #1 SLIDE-OUT TRAY.....	91
HORIZONTAL SPEEDLAY #2	92
SPEEDLAY #2 SLIDE-OUT TRAY.....	93
PUMP ENCLOSURE HOSEBED HOSE RETENTION.....	94
SPEED LAY HOSEBED HOSE RETENTION.....	94
PUMP PANEL - TOP MOUNT	94
TOP MOUNT GAUGE PANEL.....	94
SIDE PUMP PANEL MATERIAL.....	94
PANEL FASTENERS.....	94
CAPS AND ADAPTERS SAFETY TETHER.....	95
PUMP PANEL TRIM PLATES.....	95
DISCHARGE GAUGE TRIM BEZELS	95
COLOR CODED IDENTIFICATION TAGS.....	95
PUMP OPERATOR'S PANEL LIGHT SHIELD	95
TOP MOUNT WALKWAY LIGHTING.....	95
DRIVER SIDE PUMP PANEL	95
OFFICER SIDE PUMP PANEL LIGHT SHIELD AND STEP	96
PUMP OPERATOR'S PANEL.....	96
PUMP TEST PORTS	97
MASTER GAUGES.....	97
PRESSURE & COMPOUND GAUGE RANGES.....	97
FIRE RESEARCH "THROTTLEXCEL"	97
THROTTLE CONTROL AND MONITORING DISPLAY	97
ENGINE COOLER	98
TANK LEVEL GAUGE.....	98
LARGE LIGHT WATER LEVEL GAUGE, EACH SIDE OF CAB	100
WATER TANK.....	100
CAPACITY CERTIFICATION.....	101
TANK LID	101
TANK FILL TOWER.....	101
OVERFLOW AND VENT PIPE	101
TANK SUMP	102
OUTLETS.....	102
WATER TANK MOUNTING.....	102
APPARATUS BODY DESIGN CONSTRUCTION	102
BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM	102
100" WIDE FIRE BODY	102
SUPER STRUCTURE - ALUMINUM	103
STEPPING, STANDING, & WALKING SURFACES.....	103
DRIVER'S SIDE COMPARTMENTATION	103
OFFICER'S SIDE COMPARTMENTATION.....	103
BODY ROOF COMPARTMENTS (DRIVER'S SIDE).....	103
BODY ROOF COMPARTMENTS (OFFICER'S SIDE)	104



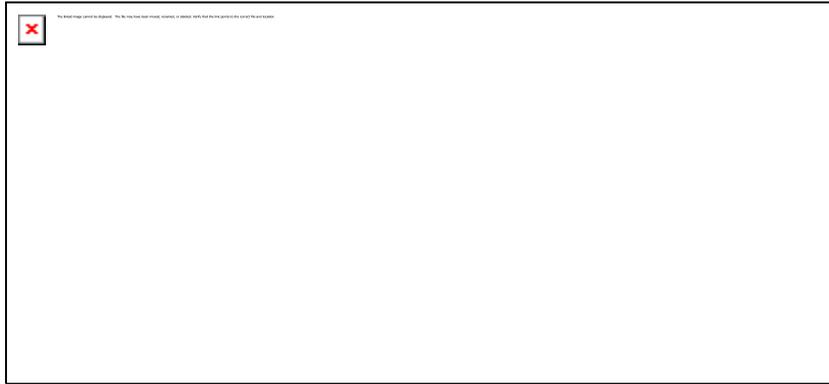
ATTACHMENT A SPECS

ROLL-UP DOORS.....	104
AMDOR ROLL-DOORS	105
PROTECTION PANEL(S)	105
SWEEP-OUT COMPARTMENT FLOORS	105
COMPARTMENT TOPS	105
COMPARTMENT DRIP MOLDING.....	105
COMPARTMENT LOUVERS.....	106
ACCESS PANELS	106
REAR BODY PANEL	106
BODY RUB RAILS	106
RUNNING BOARD STEPS.....	106
OFFICER SIDE RUNNING BOARD STORAGE WELL.....	106
DRIVER SIDE RUNNING BOARD STORAGE WELL.....	106
REAR STEP	107
INTERMEDIATE REAR STEP	107
INTERMEDIATE REAR STEP	107
ISOLATED REAR STEP COMPARTMENT	107
FOLDING STEPS - FRONT OF BODY.....	107
FOLDING STEPS - REAR OF BODY	108
SAFETY SIGN(S) AT REAR STEP AND CROSS WALKWAY(S).....	108
REAR WHEEL WELL LINERS	108
REAR FENDERETTES.....	108
AIR BOTTLE STORAGE COMPARTMENTS.....	108
AIR BOTTLE STORAGE COMPARTMENTS.....	108
DRIVER FRONT FENDER STORAGE.....	109
OFFICER FRONT FENDER STORAGE.....	109
OFFICER REAR FENDER STORAGE	109
DRIVER REAR FENDER STORAGE	109
REAR MUD FLAPS.....	109
REAR TOW EYES	109
WINCH RECEIVER POINT - EACH SIDE OF THE BODY	109
HOSE BED (76" WIDE).....	110
HOSE BED FLOORING	110
HOSE BED PARTITIONS	110
HOSE BED COVER, ALUMINUM TREAD PLATE ROLLING/LIFT UP COVER	110
ADJUSTABLE SHELVING	111
HALF DEPTH SLIDE OUT FLOOR MOUNT SHELVING	111
500 POUND FLOOR MOUNTED ROLL OUT TRAYS	111
500 POUND FLOOR MOUNTED ROLL OUT TRAYS	112
ADJUSTABLE ROLL-OUT TRAY	112
VERTICAL DIVIDERS.....	112
SWING OUT TOOL BOARD(S).....	112
VERTICAL PULL OUT TOOL BOARD	112
TURTLE TILE.....	113
120/240 VOLT ELECTRICAL SYSTEM TESTING	113
OPERATIONAL TESTING	113
HARRISON 10,000-WATT HYDRAULIC DRIVEN GENERATOR	113
GENERATOR PTO.....	114
GENERATOR WARRANTY.....	114
GENERATOR LOCATION	114
120/240 VOLT LOAD CENTER	115
120/240 VOLT WIRING METHODS	115
120/240 VOLT WIRING IDENTIFICATION.....	115
120/240 VOLT GROUNDING	115
120/240 VOLT CIRCUIT BREAKER / RECEPTACLE INSTALLATION	116
120/240 VOLT RECEPTACLE INSTALLATIONS.....	116



ATTACHMENT A SPECS

ELECTRIC CABLE REEL	116
ELECTRIC CABLE	116
JUNCTION BOX(ES)	116
CABLE ROLLER ASSEMBLY	116
LIGHTING (TELESCOPING) - ABOVE PUMP	117
LADDER STORAGE	117
GROUND LADDERS	117
PIKE POLE STORAGE	117
SUCTION HOSE STORAGE	117
SUCTION HOSE	118
STRAINER	118
HYDRANT ADAPTER	118
ADDITIONAL ITEMS SUPPLIED WITH THE VEHICLE	118
LOOSE EQUIPMENT	118
HAND LIGHT	118
Streamlight HID Litebox:	118
WHEEL CHOCKS	118
PAINT, PREPARATION AND FINISH	119
BODY PRIMER & PREPARATION	119
BODY FINISH PAINT	119
BODY PAINT	119
COMPARTMENT PAINT	119
BODY PAINT	119
PUMP / PIPING PAINT	119
CAB PRIMER & PREPARATION	119
CAB FINISH PAINT	120
CAB INTERIOR PAINT	120
CHASSIS PAINT	120
WHEEL PAINT	120
PAINT CODES	120
TOUCH-UP PAINT	120
FINALIZATION & DETAILING	120
RUST PROOFING	121
COMPUTER GENERATED LETTERING	121
LETTERING FONT	121
SCOTCH-LITE STRIPE	121
SCOTCH-LITE ACCENT STRIPES	121
REAR CHEVRON STRIPING	121
KME CHASSIS	122
OVERALL UNIT AND CUSTOM CHASSIS	122
ENGINE	122
TRANSMISSION	122
CUSTOM CHASSIS FRAME RAILS	122
FRONT AXLE	123
REAR AXLE	123
CAB STRUCTURE	123
BODY STRUCTURE	123
CORROSION	123
PAINT	123
WATER TANK	123



GENERAL INFORMATION

The proposed apparatus will be constructed to withstand the severe and continuous use encountered during emergency fire fighting services. The apparatus will be of the latest type, carefully designed and constructed with due consideration to the nature and distribution of the load to be sustained.

This proposal details the general design criteria of cab and chassis components, aerial device (if applicable), fire pump and related components (if applicable), water tank (if applicable), fire body, electrical components, painting, and equipment.

All items of these proposal specifications will conform to the National Fire Protection Association Pamphlet No. 1901, latest edition.

KME will furnish satisfactory evidence of our ability to construct, supply service parts and technical assistance for the apparatus specified.

The proposed chassis will be certified by the apparatus manufacturer as conforming to all applicable Federal Motor Vehicle Safety Standards (FMVSS) in effect at the date of contract. This will be attested to by the attachment of a FMVSS certify caution label on the vehicle by KME, who will be recognized as the responsible final manufacturer.

KME will be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the proposed apparatus. These records will be maintained in KME's factory for a minimum of twenty (20) years. The file will contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents. The purchaser will have access to any and all documents contained in this file upon official written request.

"TOP OF THE LINE" CHASSIS

KME is proposing a custom built chassis, which is "Top Of The Line" including the cab structure and design, Multiplex electrical system, drive train and frame assembly.

GENERAL CONSTRUCTION

The proposed apparatus, assemblies, subassemblies, component parts, etc., will be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is subjected to when placed in service. All parts of the apparatus will be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in fire fighting service. All parts of the

proposed apparatus will be strong enough to withstand general service under full load. The apparatus will be so designed that the various parts and readily accessible for lubrication, inspection, adjustment and repair.

The apparatus will be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between front and rear axles that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters will be carried without overloading or injuring the apparatus.

SINGLE-LINE RESPONSIBILITY

KME is a true "sole source" manufacturer. KME engineers, designs, manufactures, builds and paints our own fire apparatus cab, chassis, body, aerial devices and electrical systems. All work is done in KME owned and operated manufacturing facilities by KME direct employees. This capability provides consistent design and manufacturing procedures that will reduce warranty issues and provide ease in parts replacement.

PRODUCT LIABILITY INSURANCE

KME provides liability and facility insurance equaling \$30,000,000.00, which is one of the highest available in the fire industry. Reference attached documentation.

SERVICE CENTER AND PARTS DEPOT

KME has an authorized service center, with a staff of factory-trained mechanics, well versed in all aspects of service for all major components, of the apparatus within a 300-mile radius of the Purchaser. In addition, KME will maintain a separate service facility at the manufacturing site, in order to satisfy the need for possible major emergency service work.

PRICES AND PAYMENTS

The bid price will be F.O.B. Destination, on a delivered and accepted basis at the Fire Department.

Total price on KME's proposal sheet will include all items listed in these specifications.

KME has computed pricing less federal and state taxes. It is understood that any applicable taxes will be added to the proposed prices, unless the purchaser furnishes appropriate tax-exempt forms.

DELIVERY TIME

KME is proposing to complete the apparatus delivery time based on the number of calendar days, starting from the date the sales contract is signed and accepted by KME Fire Apparatus.

Delivery Time: _____ Calendar Days

FAIR, ETHICAL AND LEGAL COMPETITION

In order to ensure fair, ethical, and legal competition, neither original equipment manufacturer (O.E.M.) nor parent company of the O.E.M. will have ever been fined or convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

MATERIAL AND WORKMANSHIP

All equipment furnished will be guaranteed to be new and of current manufacture, to meet all requirements of purchaser's specifications.

All workmanship will be of high quality and accomplished in a professional manner so as to insure a functional apparatus with a pleasing, aesthetic appearance.

SALES ENGINEER

KME will designate an in house individual to perform KME's sales engineer functions. The sales engineer will provide a single point interface between the purchaser and KME on all matters concerning the contract.

APPROVAL DRAWING

A detailed drawing of the apparatus will be provided to the Westfield Fire Department for approval before construction begins. A copy of this drawing will also be provided to the manufacturer's representative. Upon Westfield Fire Department approval, the finalized drawing will become a part of the total contract.

The drawing will show, but is not limited to, such items as the chassis make and model, major components, location of lights, sirens, all compartment locations and dimensions, special suction, discharges, etc. The drawing will be a visual interpretation of the apparatus as it is to be supplied.

INSPECTION VISITS

KME will provide three (3) factory inspection trips to KME's facility. Transportation, meals, lodging, and other requisite expenses will be the bidder's responsibility.

Accommodations shall be for four (4) Fire Department representatives per trip.

The factory visits shall occur at the following stages of production of the apparatus:

- Pre-construction / blueprint review.
- Midpoint completion of entire apparatus.
- Final inspection upon completion.

Travel arrangements less than 1000 miles from the manufacturing facility will be via ground transportation.

The customer maintains the right to inspect the apparatus, within KME's normal business hours. At any other point during construction expenses incurred during non-specified inspection visits will be the responsibility of the customer.

During inspection visits, the customer reserves the right to conduct actual performance tests to evaluate completed portions of the unit. Testing will be accomplished with the assistance and resources of the contractor.

INSTRUCTION MANUALS/DRAWINGS, SCHEMATIC

KME will supply at time of delivery, two (2) CD copies of a complete operation and service manual covering the complete apparatus as delivered and accepted.

The manual will contain the following:

- Descriptions, specifications, and ratings of chassis, pump (if applicable), and aerial device.
- Wiring diagrams.
- Lubrication charts.
- Operating instructions for the chassis, any major components such as a pump and any auxiliary systems.
- Instructions regarding the frequency and procedures recommended for maintenance.
- Parts replacement information.

"AS BUILT" WIRING SCHEMATICS

In accordance with standard commercial practices, KME will supply two (2) copies of "AS BUILT" wiring schematics/diagrams for the entire vehicle at the time of delivery.

CONTINGENCY FUND

An allowance of \$0,000.00 is included in the proposal price to be used by the Westfield Fire Department for additional options or equipment. In the event this fund is not utilized completely, the remaining funds will be credited back to the Westfield Fire Department.

U.S.A. MANUFACTURER

The entire apparatus will be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service.

QUALITY MANAGEMENT

KME operates a Quality Management System in compliance with ISO 9001. This business management system allows KME to monitor processes to ensure they are effective; keep adequate records; check output for defects, with appropriate and corrective action where necessary; regularly review individual processes and the quality system itself for effectiveness; and facilitate continual improvement.

TABLE OF CONTENTS

To provide for ease of bid comparison and to clearly locate all proposed items, KME has generated a Table of Contents that is provided at the beginning of the proposed bid specifications.

COOPERATIVE PURCHASING

KME is pleased to allow other public agencies to use the purchase agreement resulting from this invitation to bid. The condition of such use by other agencies will be that any such agency must make and pursue contact, purchase order/contract, and all contractual remedies with KME. Such tag-on's will be done so that the original purchasing agency has no responsibility for performance by either KME or the agency using the contract.

GENERAL APPARATUS DESCRIPTION "PUMPER"

The unit shall be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 Revision), which shall include the following required chapters as stated in this revision:

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 5 Pumper Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices
- Chapter 14 Driving and Crew Areas
- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 16 Fire Pumps and Associated Equipment
- Chapter 18 Water Tanks

CAB SAFETY SIGNS

The following safety signs shall be provided in the cab:

- A label displaying the maximum number of personnel the vehicle is designed to carry shall be visible to the driver.
- "Occupants will be seated and belted when apparatus is in motion" signs shall be visible from each seat.
- "Do Not Move Apparatus When Light Is On" sign adjacent to the warning light indicating a hazard if the apparatus is moved (as described in subsequent section).
- A label displaying the height, length, and GVWR of the vehicle shall be visible to driver.
- This label shall indicate that the fire department will revise the dimension if vehicle height changes while vehicle is in service.

CHASSIS DATA LABELS

The following information shall be on labels affixed to the vehicle:

Fluid Data

- Engine Oil
- Engine Coolant
- Chassis Transmission Fluid
- Pump Transmission Lubrication Fluid
- Pump Primer Fluid (if applicable)
- Drive Axle(s) Lubrication Fluid
- Air Conditioning Refrigerant
- Air Conditioning Lubrication Oil
- Power Steering Fluid
- Cab Tilt Mechanism Fluid
- Transfer Case Fluid (if applicable)
- Equipment Rack Fluid (if applicable)
- Air Compressor System Lubricant
- Generator System Lubricant (if applicable)
- Front Tire Cold Pressure
- Rear Tire Cold Pressure
- Aerial Hydraulic Fluid (if applicable)
- Maximum Tire Speed Rating

Chassis Data



ATTACHMENT A SPECS

- Chassis Manufacturer
- Production Number
- Year Built
- Month Manufactured
- Vehicle Identification Number

Manufacturers weight certification:

- Gross Vehicle (or Combination) Weight Rating (GVWR or GCWR)
- Gross Axle Weight Rating, Front
- Gross Axle Weight Rating, Rear

ROLLOVER STABILITY

The apparatus shall meet the criteria defined in 4.13.1 for rollover stability as defined in the 2009 NFPA Standard for Automotive Fire Apparatus.

****** CAB AND CHASSIS ******

"PREDATOR™" CAB TYPE

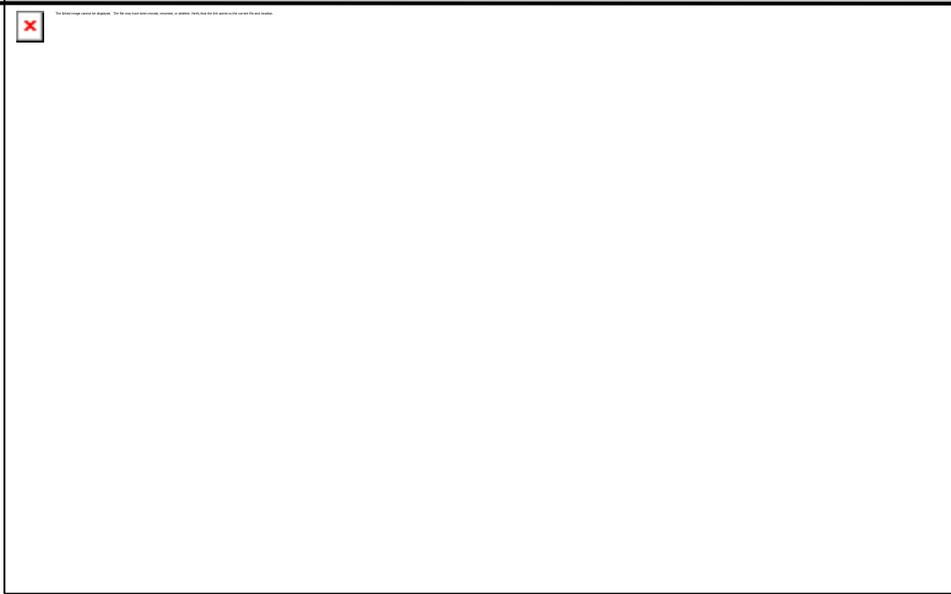
- **FULL TILT**
- **CONTOUR WINDSHIELD**

The cab shall be a custom tilt style, built specifically for fire service. The cab shall be a cab over engine design, with integral tilt mechanism and engine access from inside the cab.

Cab shall be designed, fabricated, assembled in its entirety, and installed on the frame rails in the manufacturer's factory. This requirement will eliminate any split responsibility in warranty and service.

OPEN SPACE DESIGN

The cab interior shall be the "Open-Space" design with no wall, window or vertical support posts between the front and rear crew areas to allow direct communication, better visibility and air circulation in the cab.



CAB MATERIAL

The cab shall be fabricated from 5052-H 32 aluminum alloy, utilizing the minimum material thickness as follows:

- Cab side panels 0.125 thick (1/8")
- Cab roof 0.125 thick (1/8")
- Forward cab front sheet 0.125 thick (1/8")
- Interior cab panels 0.125 thick (1/8")
- Other panels 0.125 thick (1/8")
- Cab doors 0.1875 thick (3/16")
- Engine enclosure side panels 0.250 thick (1/4")

CAB - BASE CONSTRUCTION

Cab sub-frame shall be a welded assembly fabricated of 6063 structural aluminum alloy. This frame shall extend the full length and width of the cab and be secured to the chassis frame through two (2) rear urethane self centering load cushions, two (2) forward pivot brackets, and two (2) cab locks. The cab shall be of entirely welded construction.

The front cab wall shall be of double wall type construction, featuring an inner and outer panel.

CRASH TESTING CERTIFICATION

To ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

Furthermore, proof of testing and certification shall be provided that the cab, in accordance to SAE J2420 was front impact tested at 2.1 times the standard energy required in SAE J2420, thus exceeding the NFPA requirement.

This test shall be performed with no support immediately behind the cab, thus providing an authentic test result.

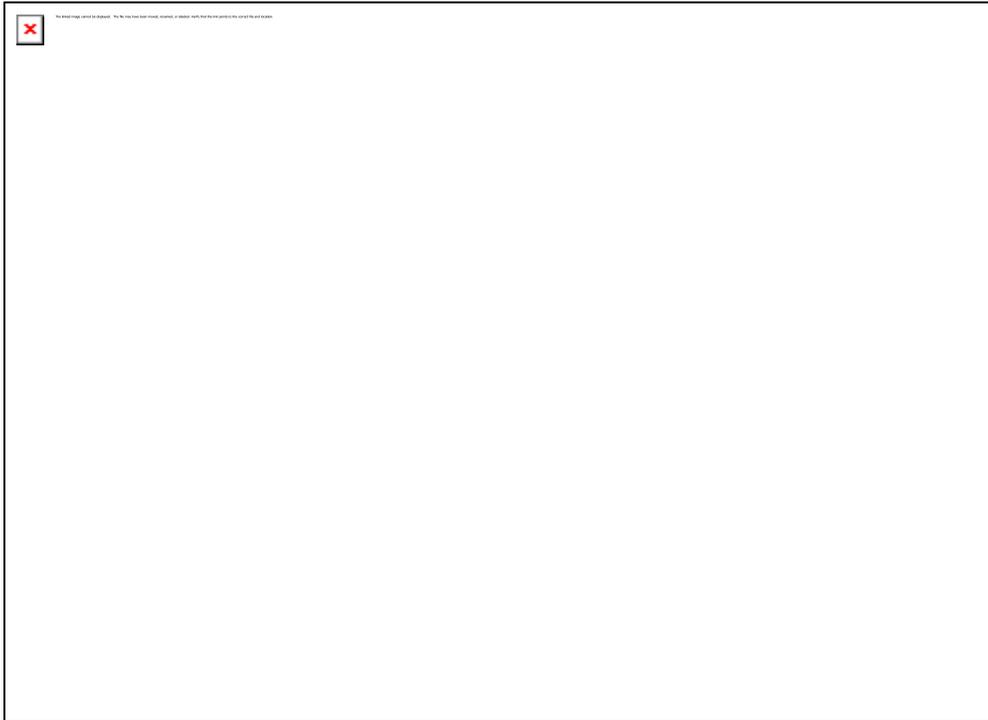
ROOF AND SIDE LOAD TESTING

The cab design will include additional third party testing to ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

The manufacturer shall provide proof that third party testing has been conducted to prove a static roof and a static side-load test has been completed. In these tests, a 120,000 pound static load was first applied to the roof. This test was followed by applying the same 120,000 pound static load to the side of the cab.

These tests will be conducted per the SAE J2422, Cab Roof Strength Evaluation, protocol and the ECE R29, Uniform provisions concerning the approval of vehicles with regard to the protection of occupants of the cab of a commercial vehicle, protocol.

During both tests, the cab will withstand these loads without encroachment into the occupant survivable space and all doors remained closed during the test. The tests will be documented with photographs and real-time video in a report provided to the manufacturer.



DIMENSIONS - EXTENDED LONG FOUR DOOR STYLE CAB

Minimum Cab Dimensions:

- Overall width 100"
- Inside width across ceiling 92"
- Front area floor to ceiling 63"
- Top of front seat to ceiling 44" (depending upon seat type)
- Seat back to steering wheel 22" (depending upon seat type)
- Inside width (door to engine enclosure) 24" (driver's side, at floor)
- Inside width (door to engine enclosure) 20-1/2" (officer's side, at floor)
- Crew seat area width 92"
- Outer crew seat risers to rear wall 64-1/2"
- Centerline axle to rear wall 82-1/2"
- Floor to top of engine enclosure 30"
- Centerline axle to front of cab 74"

Glass Area Dimensions:

- Windshield (Contour) 3,422 sq. in.
- Front door window, retractable 743 sq. in. each
- Rear door window, retractable 875 sq. in. each
- Side fixed crew windows 620 sq. in. each

Cab Entry Door Width Dimensions

- Forward door opening 43" wide
- Rear door opening 40" wide

Cab Entry Step Dimensions

- Forward door recessed step 32" wide x 9" deep
- Rear door recessed step 32" wide x 9" deep

Cab Entry Door Height Dimensions

- Forward door opening 76-1/4" high
- Rear door opening 91-1/4" high

CAB ROOF

The roof will be of a split level design with radius edges for an aesthetic, streamline appearance. The roof be constructed the same material as the main structure and be internally reinforced using framing which span the entire width and length of the cab for maximum structural integrity. This shall allow the roof to support personnel and roof mounted equipment without the need for additional reinforcement.

The cab roof over the rear crew area shall be raised sixteen (16) inches higher than the front driver and officer area. The front face of the raised roof section shall be sloped at a 45 degree angle, creating a streamlined interface with the standard, lower, forward roof section. This design shall allow for additional interior height in the rear crew area.

The rear crew area doors shall be "Vista-Style", extending full height to the radius edge of the raised roof.

Approximate dimensions:

- Crew area floor to ceiling 70"
- Top of crew seat to ceiling 52" (depending upon seat type)

CAB DOORS

Four (4) side-opening doors shall be provided. The cab doors shall be totally aluminum construction with an extruded aluminum frame and a 3/16" thick aluminum outer door skin. Doors shall be full height from the step to the cab roof extrusion and enclose the step area when the doors are closed.

The forward cab door opening shall be a minimum of 40" wide, and the rear cab door opening shall be a minimum of 37" wide. The rearward cab doors shall have a radius cutout allowing the door opening to protrude forward over the cab wheel well, while providing full access to the rear crew area.

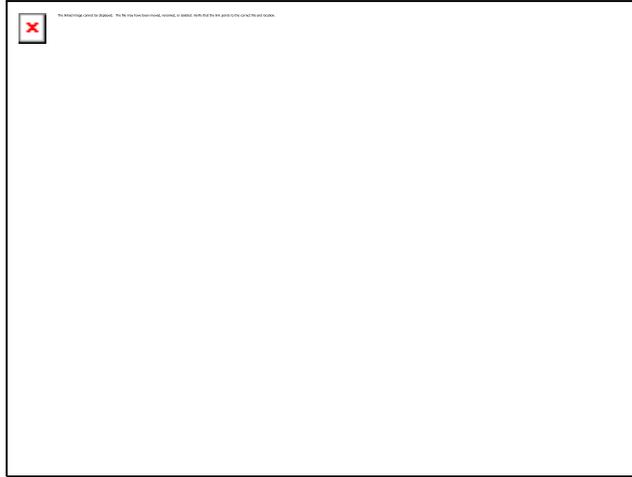
There shall be a heavy duty piano type stainless steel hinge on each door with a minimum pin diameter of 5/16". Hinges shall be slotted for ease of horizontal and vertical adjustment. There shall be a cab door seal and the doors shall close flush with the side of the cab. A heavy-duty 2 1/2" wide reinforced rubber strap shall be utilized to prevent the cab doors from opening greater than 90 degrees.

ENTRY STEP AREA

Each of the forward entrance steps shall be a minimum of 8-1/2" deep with the floor board recessed a minimum of 5" to avoid "shin knocking". Each step shall be a bolt-in cast aluminum step. The cab steps risers shall be overlaid with bright finish aluminum tread plate.

Each of the rear entrance steps shall be a minimum of 8-1/2" deep. An intermediate step shall be provided between the lower entrance step and the crew area floor for ease of entry and egress. Each upper section of the steps and respective step risers shall be constructed as an integral part of the cab

construction and shall be overlaid with bright finish aluminum tread plate. Each lower step shall be a bolt-in cast aluminum step.



AUXILIARY CAB STEPS

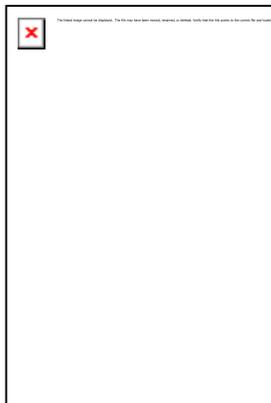
An auxiliary cab step shall be provided under each front cab door, outside of the cab. The step shall be constructed from aluminum with brushed aluminum on the vertical supports. The stepping surface shall be Grip-Strut anti-slip material.

AUXILIARY CAB STEPS

An auxiliary cab step shall be provided under each rear cab door, outside of the cab. The step shall be constructed from aluminum with brushed aluminum on the vertical supports. The stepping surface shall be Grip-Strut anti-slip material.

DOOR LATCHES

A semi-recessed chrome plated pull handle, capable of operating with a gloved hand, shall be provided on the exterior of each cab door. Heavy-duty, bright finish cast paddle latches shall be provided on the interior of each cab door. Door latch mechanisms which utilize spring steel clamps shall not be considered due to their tendency to both rust and break. The interior door latch cables are to be designed to reduce adjustment or possible wear at the adjustment turnbuckles.



Each exterior cab door shall be equipped with keyed locks. The cab doors shall be capable of being locked from the outside with a key and manually from the inside or with a momentary switch that shall either lock or unlock the doors. A switch shall be provided on both the driver and officer side of the cab dash.

KEYLESS ENTRY SYSTEM

A Trimark brand, keyless entry system shall be provided on all cab doors. This system shall lock the doors by use of the key fob and shall unlock the doors by either the key fob or the touch pads. The system shall include two (2) "e-PAD", five number lighted touch pads mounted one (1) each side to the rear of each front cab door. The system shall also incorporate one (1) "e-FOB", 2 button RF transmitter, one (1) RF receiver module and a total of four (4) power door lock actuators. The driver door shall have a traditional key - lock installed.

DOOR WINDOWS

Each side cab door shall have a tinted retractable window operated by a hand crank mechanism. The window track shall be designed into the door frame extrusion, which shall be extruded with a track groove to house a window track and seal. The window shall be capable of being removed from an access slot designed in the bottom of the door frame.

Each side cab door window shall be designed with a custom extruded trim plate, which shall conform to the perimeter of the window opening in each door. The trim plate shall extend from the edge of the door skin to the window and shall have a silver anodized finish.

INNER DOOR PANELS

The cab door interior panels shall be covered with a one piece, full height, brushed aluminum panel for ease of maintenance. The panel shall be 1/8" aluminum with a brushed finish and shall be designed to allow easy access to the inner door.

Each interior cab door panel shall be equipped with reflective ScotchLite material that shall cover at least 96 in².

CAB DOOR FRAME AND JAMB SCUFF PLATES

A polished stainless steel trim plate shall be provided rearward of each cab door opening to protect the vertical cab corner rearward of the door opening and on the cab door striker posts to protect the cab paint when exiting and entering the cab.

EXTERIOR CAB WALL OVERLAY

A bright finish aluminum tread plate overlay shall be provided over the entire exterior rear cab wall. The tread plate overlay shall be sealed with caulking around the edges to prevent moisture from getting between the cab and the overlay.

TRANSVERSE EXTERIOR CAB COMPARTMENTS

Two (2) compartments shall be provided, to the rear of the crew cab doors. The compartments shall be approximately 38" high, 16" wide and 27 3/4" deep in the lower area and transverse above the frame rails. The transverse section shall be approximately 20" wide x 18" high. The transverse section shall be designed to be capable of being utilized for a seat riser. To make the compartment accessible from inside the crew area the front wall of the transverse section shall be with two (2) flat panel drop down doors.

The exposed section of the compartment in the rear crew area shall be painted with a textured paint to match the cab interior. The interior of the compartment shall be painted to match the color or material provided in the body compartments.

Compartment door shall have a 3/16" aluminum exterior skin door with a one (1) inch box pan and a stainless steel "D" ring handle. Door shall be hinged on the forward edge with a stainless steel vertical piano hinge so it opens toward the rear cab door. The door shall be held in the open position by a gas shock stay arm.

Each compartment shall contain a light for illumination of the compartment and shall be wired to a door jamb switch to automatically come on when the door is opened. The light shall be the same style that is used in the body compartments.

WINDSHIELD/GLASS

A two piece, symmetrical, safety glass windshield shall be provided on the cab for the driver and officer providing a clear viewing area. The windshields shall be full width to the center of the front cab support for each side and provide the occupants with a panoramic view. To provide enhanced peripheral vision on each side of the cab, the windshield and cab structure shall be designed with radius corners, which provide a minimum of 8" of glass area, measured from the glass face to the side edge near the door post. The windshield shall consist of three (3) layers; the outer light, the middle safety laminate and the inner light. The thick outer light layer shall provide superior chip resistance, the middle safety laminate layer shall prevent the windshield glass pieces from detaching in the event of breakage and the inner light shall provide yet another chip resistant layer.

The windshield will be a contour design with 3422 sq. in. of area for improved visibility and style. The windshield glass shall be designed so it can be used on either the driver or officer side. Single piece windshields that utilize epoxy or that are bonded to the cab structure shall not be acceptable.

WINDSHIELD WIPERS AND WASHER

Dual, electric operated, pantographic type windshield wipers shall be provided. One (1) electric drive motor will be provided for each wiper.

Wipers shall have "HI/LO" and "INTERMITTENT" operating speeds. "HI/LO" speeds shall be controlled by a steering column control, within the turn signal control stem. "INTERMITTENT" operation shall be controlled by a twist switch within the control on the steering column. The wipers shall be of the self-parking type.

Windshield washers shall be electric operated wet-arm type with a 3/4 gallon washer fluid reservoir, mounted inside the engine enclosure and readily accessible through the engine hatch at the rear of the engine enclosure. The washer control shall be integral with the intermittent wiper control switch.

There shall be individual removable panels on the front face of the cab for access to the wiper motor assemblies.

Wipers are to be programmed to shut off when the parking brake is engaged.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Windshield wipers shall survive testing in excess of 3 million cycles in accordance with section 6.2 of SAE J198 "Windshield Wiper Systems – Trucks, Buses and Multipurpose Vehicles". The bidder shall certify that the wiper system design has been "Third party tested" and that the wiper system has met this criteria.

The windows provided on each side of the cab behind the forward cab doors shall be deleted.

DARK TINTED REAR WINDOW GLASS

The windshield and the forward cab door glass shall be provided with standard DOT green automotive tint. The side cab windows to the rear of the front doors, the rear cab door windows and any rear viewing windows shall be equipped with a dark automotive tint.

GRAB HANDLES

Four (4) 1-1/4" diameter x 28" long, knurled, bright anodized aluminum handrails shall be provided, one (1) at each cab door entrance. Grab rail stanchions shall be chrome plated and offset when necessary to prevent "hand-pinching" when opening or closing the doors. Formed rubber gaskets shall be provided between each stanchion base and the cab surface.

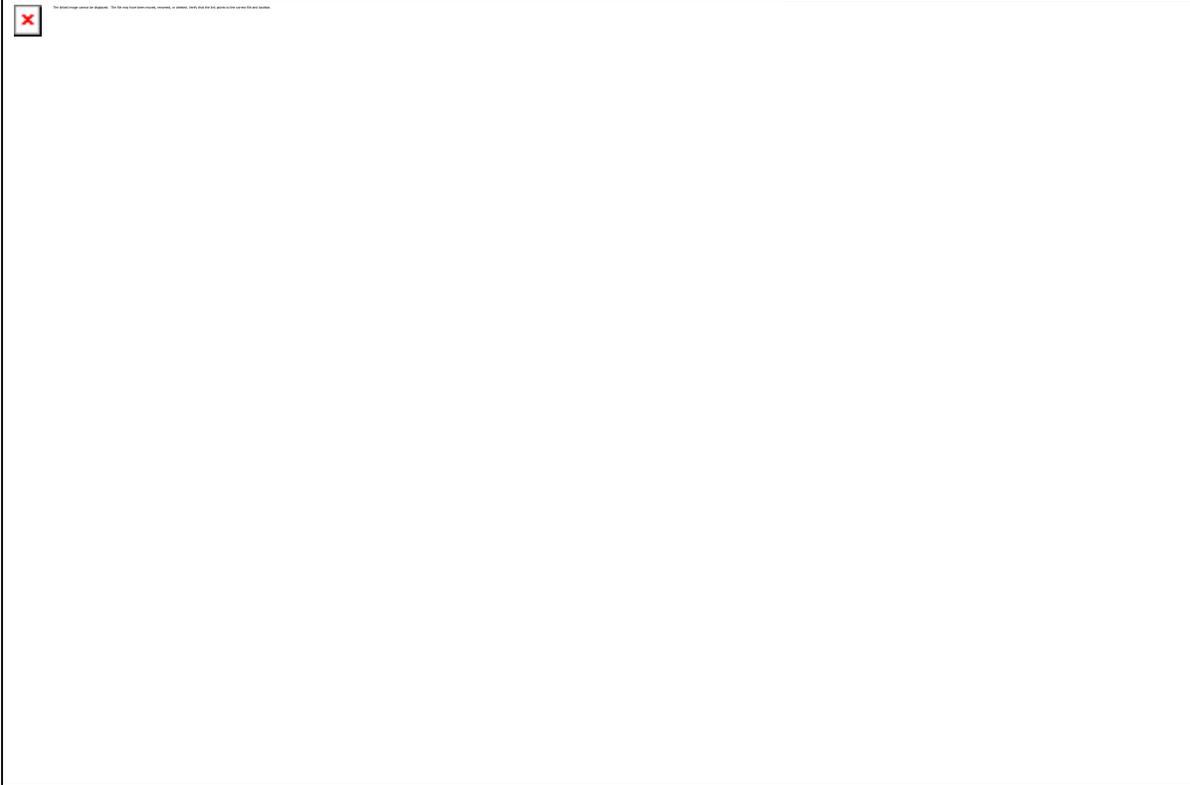


INTERIOR GRAB RAILS

Four (4) vertically mounted 12" black cast aluminum "D" style entry assist handles shall be installed, one (1) on the officer's side of the cab interior "A" post and one (1) on each side of the cab interior on the "C" post in the crew area to assist in entry and exiting of the cab.

FRONT CAB GRILL

There shall be a bright finished, custom formed grille assembly for maximum air flow to the charge air cooler and the radiator. The grille shall be designed with an aesthetic look, with large horizontal louvers that will be reinforced to provide integrity. The grill design shall match the thickness of the headlights to provide a streamlined, cohesive front trim package.



A heavy duty, painted steel bug screen, shall be provided behind the front grill assembly to protect the radiator from bugs and other debris. The screen shall be secured to the front of the cab, behind the main grill.

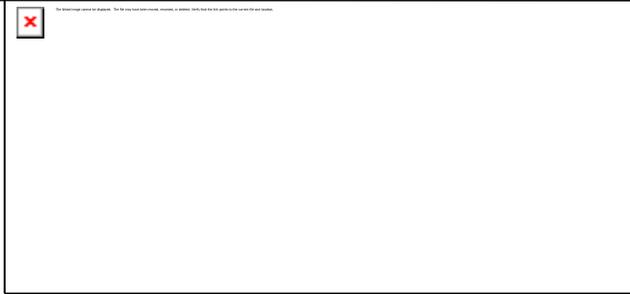
AIR INTAKE/OUTLET

Two (2) bright finished, custom formed air inlets/outlets shall be provided horizontally above the wheel well opening, one on each side of the cab. The grille shall be designed with an aesthetic look with horizontal louvers that will be equipped with a painted, expanded aluminum, screen to serve as a secondary ember separator. The side intakes shall be bolstered a minimum of 1" from the skin of the cab face. The design shall permit proper ducting of air through the engine compartment and cooling system.

ENGINE AIR INTAKE SYSTEM

The left side inlet, used for the air intake to the air cleaner, shall be equipped with dual ember separators for separating burning embers from the air intake system. This system shall be such that particles larger than .039 inches (1 mm) in diameter cannot reach the air filter element.

No part of the air intake system for the engine shall be lower than the top of the frame rails to ensure the vehicle can navigate pooled water without any part of the air intake system being exposed to water when the vehicle is stopped or in motion. Chassis designs, which the engine air intake system is lower than the frame rails shall not be acceptable!



WHEEL WELL LINERS

The front cab wheel wells shall be equipped with fully removable, bolt-in, aluminum inner wheel well liners. The liners shall extend full depth into the truck frame. The completely washable wheel well liners shall be designed to protect the cab substructure, inner panels, and other miscellaneous installed components from road salts, debris, dirt accumulation and corrosion.

FENDERETTES

The cab wheel well openings shall be trimmed with replaceable, bolt-in, polished aluminum fenderettes. The fenderettes shall be secured to the cab with stainless steel threaded fasteners along the internal perimeter of the wheel well. Dissimilar metal tape and black vinyl trim molding shall be used where the cab and fender meet.

FRONT MUD FLAPS

Heavy duty, black rubber type mud flaps shall be provided behind the front wheels.

VELVAC V-MAX MIRROR, SIGNAL INDICATOR and CAMERA

Two (2) Velvac 716855 V-MAX mirrors shall be furnished, one on each front cab door. Each mirror shall have a 98.7 sq. in flat glass viewing area and a 30 sq. in convex viewing area in a one piece injection molded chrome plated ABS plastic housing. All heads shall be electrically heated, controlled by one (1) switch on the dash convenient to the driver. The upper flat glass position shall be controlled by a dual purpose, four way selector switch on the dash, convenient to the driver. This switch that allows the driver to select either the officer side mirror or the driver side mirror; the lower convex sections shall also be electrically controlled.

Mirror heads shall be installed on a Model 2025 one piece, chrome plated die cast aluminum, fixed arm bracket, mounted on the forward portion of each front door below the side windows. Each mirror shall have an arrow type turn signal indicator in the outboard area of the flat glass head. These indicators shall work in conjunction with the turn signals. Each mirror shall also include a LEM camera for side visibility, compatible with the on board camera system. This camera shall have CMOS technology to prevent "smear and/or blooming" so visibility is maintained under sunlight, glare and bright headlight conditions.

INTERIOR CAB TRIM

The cab interior shall be constructed to create an ergonomically designed interior to be user friendly and functional for the driver and officer.

The forward overhead panel shall be covered with a three (3) piece custom formed ABS vinyl overlay, which shall have integrated windshield defroster/heat vents and four (4) comfort vents.

All ABS formed material panels, as well as all of the interior upholstery panels shall be medium gray in color. The upholstered cab overhead and side wall portions shall utilize gray Durawear upholstery with padding underneath to provide additional insulation.

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

INTERIOR REAR WALL

The interior rear wall of the cab shall be covered with gray Durawear for durability and shall match the other upholstered areas of the cab.

A twelve (12) inch high bright finish aluminum tread plate scuff plate shall be provided on the lower portion of the rear interior cab wall.

UNDER SEAT STORAGE COMPARTMENTS

There shall be a compartment provided under each front seat. Each compartment shall be accessible from the side of the seat riser when the door is opened. The compartment under the driver's seat shall measure 13 1/2"W x 13 1/2"D x 8"H. The compartment under the officer's seat shall measure 13 1/2"W x 13 1/2"D x 8"H.

Due the drivers seat being equipped with Rolltek and being an air ride seat, the S4 pretensioner for the seat will be mount in the seat riser or compartment for the driver's seat.

Due the officer seat being equipped with Rolltek and being an air ride seat, the S4 pretensioner for the seat will be mount in the seat riser or compartment for the officer seat.

BARYFOL FLOORING

The floor of the driver's compartment and the floor of the crew area shall be lined with BARYFOL vinyl composite flooring to comply with NFPA noise and heat requirements.

The material utilized for this application shall be certified to meet the NFPA 1901, 2009 revision for anti slip walking surfaces.

CAB ACOUSTICAL INSULATION

One (1) inch thick acoustical insulation shall be provided on the cab roof and rear and side walls of the cab. This material shall be fitted between the cab structural members and secured with adhesive to provide an insulation barrier for noise and heat.

ENGINE ENCLOSURE

The forward portion of the engine enclosure shall be covered with a vinyl ABS material formed overlay to match the balance of the cab interior. To allow maximum "elbow room" for the driver and officer, the forward portion of the engine enclosure shall feature a contour shape. The engine enclosure shall not significantly obstruct the driver's vision in any direction. The enclosure shall be an integral part of the cab structure, which shall be constructed from .250 5052-H32 aluminum, providing adequate strength to support radio, map boxes, etc. The engine enclosure shall be insulated to protect from heat and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1900 pamphlet.

A, hinged access door shall be provided in the top rearward portion of the engine enclosure. The door shall allow access to the engine oil, transmission fluid, power steering fluid level dipsticks and the windshield washer fluid reservoir. The access door shall be provided with two (2) flush mounted latches and gas shock holders. There shall be a gray ABS vinyl cover over the access door to give a cleaner look to the top of the engine enclosure and doghouse area.

SUN VISORS

To provide maximum protection for the driver and officer, two (2) padded vinyl sun visors shall be mounted in the cab overhead on each side.

ADVANCED OCCUPANT RESTRAINT SYSTEM

The cab shall be equipped with advanced occupant restraint systems. This system shall function in the event of a side roll over and shall be compatible with occupants ranging from a 5th percentile female to 95th percentile male.

This system consists of a roll sensor, seat and occupant pretensioners; buckle pretensioners and inflatable side airbags. This system shall be functionally active while the truck is in operation.

A hybrid or pyrotechnic inflator shall inflate the side airbags. The bag should remain inflated to the extent of providing head cushioning for 10 seconds after inflation. Pretensioners should be compatible with either ABTS or body mounted seats and seat belts. Buckle pretensioners shall be used on static or power seats where there is no air suspension. The buckle pretensioners must be capable of stroking 125 mm.

ROLL SENSOR

The roll sensor continually monitors the roll rate and angle of the vehicle, and deploys safety devices when a roll event occurs. Deployment determination is made by a combination of vehicle angle and angular rate. Vehicle deployment angle shall never exceed 60 degrees.

The roll sensor performs self-diagnostics each time the vehicle is started. A dash-mounted light shall turn off after approximately 10 seconds if the sensor is functioning. During operation, the roll sensor monitors for proper connection to each safety device in the vehicle once per second. If improper connection is measured at any device or if an internal fault occurs, the roll sensor shall illuminate the dash-mounted light. The system shall continue to function in the event of non-critical faults. System diagnostics are on the SAE J1587 bus.

******* CAB SEATING & ACCESSORIES *******

SEAT BELT ANCHOR TESTING

Each seat belt anchor shall be tested to withstand 3,000lbs of pull on both the lap and shoulder belt in accordance with FMVSS 210 section 4.2.

SEAT MOUNTING TESTING

Each seat mounting position shall be tested to withstand 20G's of force in accordance with FMVSS 207 section 4.2(c).

Both tests shall be performed and verified at a third party testing and evaluation center.

DRIVERS SEAT

The driver's seat shall be a H. O. Bostrom Sierra Air-50RX/HD/ABTS LH air suspension, high back bucket seat with Side Curtain Airbag.

The Side Air Curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stored position.

A suspension seat safety system shall be included. When activated the system shall pretension the seat belt then retract the seat to its lowest travel position.

The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall have a five inch fore and aft adjustment, a three inch height adjustment with heavy duty damper and a reclining seat back. The seat air ride suspension shall be pneumatically controlled from a control switch on the forward lower edge of the seat.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

OFFICERS SEAT

The officer's seat shall be a H. O. Bostrom Tanker 450 Air-50 RX/ABTS RH series air-suspension, SCBA seat with Side curtain Airbag.

The Side Air Curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stored position.

A suspension seat safety system shall be included. When activated the system shall pretension the seat belt then retract the seat to its lowest travel position.

The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall have a five inch fore and aft adjustment, a three inch height adjustment with heavy duty damper and a reclining seat back. The seat shall include a SCBA storage area with integral headrest. The seat air ride suspension shall be pneumatically controlled from a control switch on the forward lower edge of the seat.

The seat {will/shall} be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The seat shall include a SmartDock Gen II bottle bracket.

DELETE REAR FACING, OUTBOARD, DRIVER SIDE SEAT

There shall not be a crew seat provided in the rear facing driver's side position to allow for mounting of compartments and/or other specified equipment.

DELETE REAR FACING, OUTBOARD, OFFICER SIDE SEAT

There shall not be a crew seat provided in the rear facing officer's side position to allow for mounting of compartments and/or other specified equipment.

FORWARD FACING, OUTBOARD, OFFICER SIDE SEAT

The officer's side outboard forward facing crew seat shall be an H. O. Bostrom Tanker 450 ABTS RH series fixed SCBA seat with Side Curtain Airbag.

The Side Air Curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stored position.

A suspension seat safety system shall be included. When activated the system shall pretension the seat belt around the occupant to firmly hold them in place in the event of a collision

The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include an SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The seat shall include a SmartDock GenII bottle bracket.

CENTER FORWARD FACING CREW SEATS

Two (2) center inboard forward facing crew seats shall be provided, each seat shall be an H. O. Bostrom Tanker 450 ABTS series fixed SCBA seat. Each seat shall have a tapered and padded seat cushion with lumbar support. Each seat shall include an SCBA storage area with integral headrest.

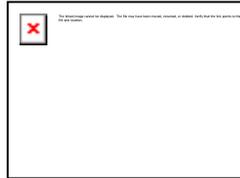
Each seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The two (2) center inboard forward facing crew seats shall have a flip-up style seat.

The seat shall include a SmartDock GenII bottle bracket.

FORWARD FACING CREW SEAT RISER

The forward facing seats shall be mounted on a full width aluminum riser that shall be welded into the cab during cab construction. The riser shall match the interior of the cab and shall have open compartments with no doors.



SEAT UPHOLSTERY MATERIAL

The seats shall be upholstered with heavy duty gray tweed Durawear material as provided by Bostrom.

PADDED SCBA OPENING COVERS

Removable padded covers shall be provided for the SCBA seat openings.

SEAT BELT CUSHION SENSORS AND BELT SENSORS

The apparatus shall be equipped with an Akron/Weldon seat belt warning system. The system shall consist of a Seat Belt module, dash mounted display and an audible alarm.

Seat belt and seat cushion sensors shall be provided on the five (5) specified seating positions.

VEHICLE DATA RECORDER

An Akron/Weldon Vehicle Data Recorder (VDR) system shall be provided. The system shall include an NFPA compliant "Black Box" with reporting software that shall be capable of data storage to coincide with the NFPA requirements.

Data storage capabilities shall include interfaces with the following systems:

- Display module (Master Optical Warning Device)
- VDR, date & time stamp
- Max Vehicle speed (MPH)
- Vehicle acceleration / deceleration (MPH/Sec.)
- Engine Speed (RPM)
- ABS event
- Data password protected
- Data sampled once per second, in 48-hour loop
- Data sampled min by min for 100 engine hours
- Throttle position (% of Throttle)
- Data software
- PC / Mac Compatible
- Data summary reports.

INTERIOR CAB STORAGE COMPARTMENT

A storage compartment shall be mounted against the rear wall of the cab crew area. The compartment shall be approximately 12" deep x 53" high (depending on roof height) x 36" wide. The door opening shall be approximately 38" high x 26" wide.

The compartment shall be constructed of smooth aluminum and shall be equipped with a roll-up door. The compartment shall be painted with textured paint, matching the interior color of the cab.

Cab storage compartments are to be hinged aluminum reinforced doors with plexi-glass inserts.

INTERIOR CAB STORAGE COMPARTMENTS

A dual storage compartment shall be mounted in the cab in lieu of rearward facing crew seats. Each compartment shall be approximately 46" high x 24" wide x 24 deep. Each door opening shall be approximately 41 7/8 " high x 21" wide. Each compartment shall be constructed of smooth aluminum and shall be equipped with a roll-up door.

The compartments shall be constructed of aluminum and the exposed area of the compartment inside the cab will be painted to match the interior surface color of the cab. The compartment shall be equipped with a roll-up door.

Cab storage compartment doors are to have hinged aluminum reinforced doors with plexi-glass inserts.

Four (4) adjustable shelf(s) shall be provided in the EMS compartment. The shelf(s) shall be constructed from 3/16" brush aluminum mounted to uni-strut tracking material.

The EMS compartment shall be equipped with one (1) Weldon model #2630 halogen interior light(s). The light(s) shall be wired to automatically activate when the compartment door is open and the master battery switch is in the "on" position.

The EMS compartment shall be equipped with one (1) Amdor brand LED interior light(s). The lighting shall be wired to automatically activate when the compartment door is open and the master battery switch is in the "on" position.



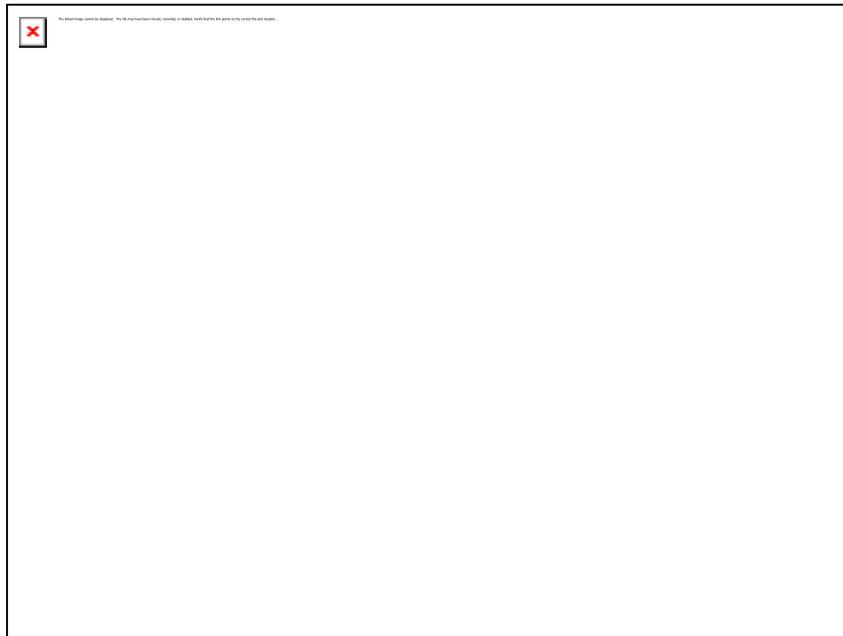
CAB DOGHOUSE STORAGE MODULE

A storage module shall be installed on the center doghouse area between the driver and officer. The module shall be constructed of 1/8" aluminum and shall be painted with a scuff resistant paint to match the cab interior. The module shall include two (2) cup holders, a pen tray, a flat open storage area for notebooks, six (6) divided storage area's for 3-ring binders, and four (4) slide in storage area's two (2) accessible from each side of the cab.



CAB INTERIOR COMPARTMENT

One (1) fully enclosed, full width compartment approximately 10" deep x 8" high mounted to the cab ceiling at the rear wall. Compartment made of 1/8" aluminum with two (2) aluminum hinged doors with latch. Doors to be of equal size and hinged at top.



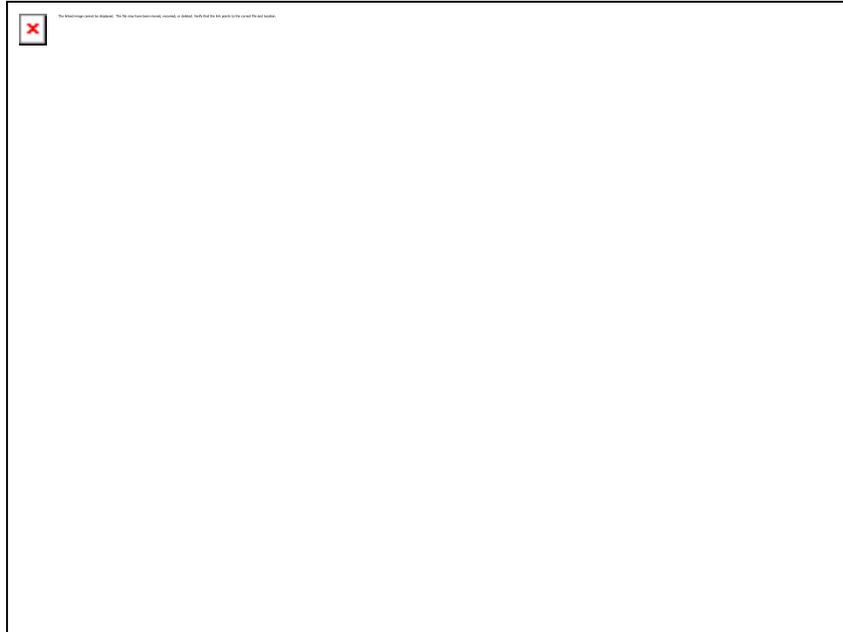
ANTENNA INSTALLATION

Two (2) antenna mounting base(s) model #MATM with 17' of coaxial cable shall be provided and installed on the lower cab roof, behind the light bar. The attached antenna wire(s) shall be run to the right side cab dash area.

The Fire Department is responsible to have the correct antenna whip installed once the apparatus is delivered.

LAPTOP COMPUTER SLIDE OUT TRAY

A slide out tray shall be installed for the officer to provide an area for laptop computer usage. In the closed position this area will be nest forward to allow access in and out of the vehicle.



CUSTOMER DIRECTED RADIO PURCHASE AND INSTALLATION

As directed by the customer with supplied quote from AMK Services, KME will purchase a M7300 radio and other equipment from AMK on Quote #256 and install in the cab as directed by the customer.

******* CAB INSTRUMENTATION & CONTROLS *******

DASH & CENTER CONSOLE

The dash gauge panel shall be a custom formed ABS pewter gray wrap-around design for improved visibility. A full complement of gauges shall be provided in custom formed bezels. The starter and ignition switches shall also be integrated into the upper left portion of the gauge panel for easier access.

All warning lights and indicators shall be located in either the gauge itself or in the warning light cluster located in the lower center portion of the dash. Each gauge shall be equipped with an international symbol that is easily recognizable, denoting the system being monitored. Instrumentation shall be backlit for easy identification.

The transmission gear selector and the spring brake control valve shall be located on an angled section of the center dash assembly toward the driver for easy access.

There shall be provisions for mounting a switch panel in the center of the dash between the driver and officer. The top center of the dash assembly shall contain one (1) removable panel to access the main chassis wiring circuits and breaker panels.

DRIVERS DASHBOARD PANEL

The main instrument panel shall be centered in front of the driver and shall be mechanically fastened to the main dash assembly. The dash panel shall be 1/8" aluminum with an anti-glare, pewter finish brushed surface. The driver's dashboard panel shall contain the gauge panel along with an instrument warning light cluster.

The main instrument panel shall contain the primary gauges. An ignition and engine start switch shall be located on main dash panel located in front of the driver.

Each gauge shall have a raised glass lens with polished chrome trim ring and be backlit by integral blue LED's. Each gauge shall be designed with an integral red warning light with a pre-programmed warning point. Gauges monitoring drive-train component status shall be of the direct data bus type capable of displaying information broadcast on the J 1939 data-link. Each gauge warning indicator shall be capable of activating an audible alarm inside the dashboard.

Additional auxiliary control switches and instruments (if applicable) shall be located within the center or overhead panel located near the driver's position.

The primary gauges shall consist of:

- Vehicle speedometer (0-80 mph)
- Engine tachometer (0-3000 rpm)
- Engine oil pressure (0-100 psi); low oil pressure warning
- Engine coolant temperature (100-250 °F); high engine temp warning (based on engine)
- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (9-18 VDC); low voltage warning at 11.8 amps
- Front air system gauge (0-150 psi); low air pressure warning at 65 psi
- Rear air system gauge (0-150 psi); low air pressure warning at 65 psi
- Fuel level (E-1/2-F); low fuel level warning @ 1/8 tank
- Air cleaner restriction gauge (0 - 40), warning at 25" restriction.

- Diesel Exhaust Fluid level (E-1/2-F); low fuel level warning @ 1/8 tank

- Engine Compression Brake Controls

WELDON V-MUX DISPLAY

A Vista III touch screen display shall be recessed mounted on the driver side for the electrical V-MUX multiplex system. The exact location shall be determined by the totality of instruments and switches on the cab dash.

ADDITIONAL WELDON V-MUX DISPLAY ON OFFICER SIDE OF CAB

An additional Weldon V-Mux Vista III touch screen display shall be recessed mounted on the officer side of the cab. The second display shall have the ability to perform and display all the same functions and information of the main display located on the driver side of the cab.

INDICATOR CLUSTER

The driver's dashboard panel shall consist of Ametek gauges, an 18 item instrument warning light cluster and a 16 item, dead front type alarm panel.

This display shall contain the system control unit that collects data from the vehicle data bus (J1939), analog sensors, and switches throughout the vehicle. This data shall be presented using

gauges, telltales and the two (2) display panels. The warning light display shall include a 2 x 20 dot matrix display, 18 telltales and 2 buttons to navigate through the screen menus.

The LCD dot matrix display shall be a 2 line by 20-character display with each character being 7 dot by 5 dot configuration. FSTN technology shall be used on the display for wide viewing capability. The module shall be backlit with amber LED's. The unit shall also be supplied with a heater to ensure proper operation over the entire 40 to +85 deg. C.

This display contains a series of two (2) screens to provide information about the vehicle. To control the display of that information, the screens are divided into two (2) menus; one that can be displayed while the vehicle is in motion and one that can only be accessed when the parking brake is set.

On the Road displays include:

- Two (2) configurable displays that can show any of the parameters the unit collects. This includes odometer, trip information, fuel economy information; all gauge data, and virtually any other data available on the vehicle that the display has access to, either through the data bus or via analog inputs.
- Two (2) trip displays for miles and hours that are capable of being reset.
- Two (2) fuel data screens: shall be provided; one for fuel remaining until empty and one for fuel economy. The fuel economy display shall be capable of being reset so that average economy over a predetermined period can be displayed.

The displays that can be accessed when the parking brake is set include:

- Engine hours as maintained by the engine ECU
- Service Alarm screens to report miles to next service or miles past required service. These screens shall allow the operator to choose the length of the service interval and shall have the ability to reset it.
- Message screens with warning messages the display has collected during the current ignition cycle. These screens shall be divided into configured warnings such as "Low Air Pressure" and the data bus faults reported by ECU's on the vehicle. Both lists shall allow the operator to review the last 12 events that occurred on the vehicle for maintenance and troubleshooting purposes.
- Diagnostic screens shall test the instrumentation system to verify it is working correctly.
- Setup screens shall be used to select either English or metric display. They shall also allow the operator to choose the data that shall be displayed by the configurable on-the-road screens.

The system shall be configured with user defined warning messages such as Low Air Pressure or High Coolant Temperature. When these events occur the warning message shall come up on the screen and can be accompanied by a buzzer. The messages shall be prioritized so the most important messages are always displayed. Whether the message can be dismissed by pressing a button shall be configurable. Messages that have been dismissed but are still active shall be retained in the message screens for review until the ignition is turned off. Listed below are the defined telltales and their indicators.

- "Right And Left Directional" arrows (green in color)
- "Ignition ON" Indicator (amber in color)
- "Hi Beam" indicator (blue in color)
- "Battery ON" indicator (green in color)
- "Parking Brake ON" indicator (red in color)
- "Check Transmission" indicator (amber in color)
- "Cab Not Latched" indicator (red in color)
- "Stop Engine" indicator (red in color)
- "Check Engine" indicator (amber in color)
- "ABS Warning" indicator (red in color)
- "Low Coolant Level" (red in color)



ATTACHMENT A SPECS

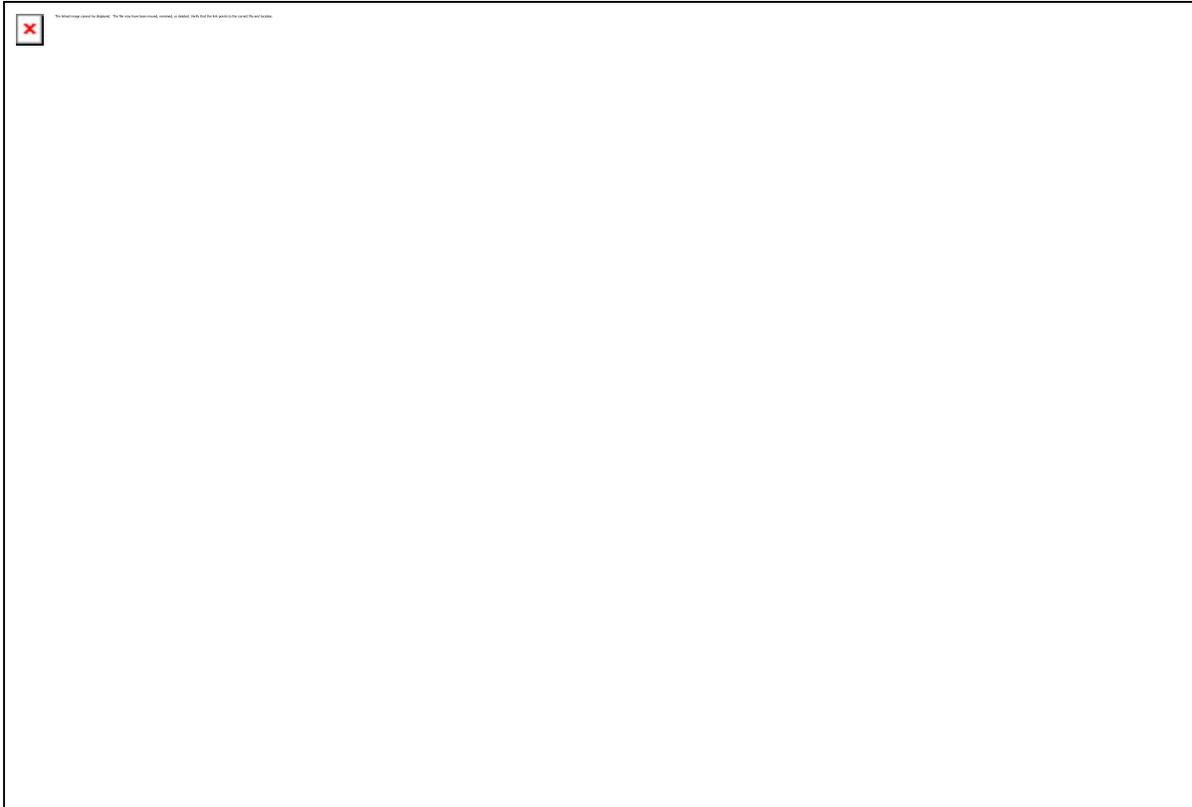
- "Fuel Restriction" indicator (amber in color)
- "Water In Fuel" indicator (amber in color)
- "Fasten Seat Belts" indicator (red in color)
- "Fast Idle" Indicator (amber in color)
- "Do Not Move Truck" indicator (red in color)
- "DPF Regeneration" (amber in color)
- "Exhaust High Temperature" (amber in color)
- "Engine Diagnostic Fault" (amber in color)
- "Retarder On" (green in color)

Listed below are indicators that may be included, depending upon the vehicle configuration:

- "Wait To Start" indicator (amber in color)
 - "Exhaust System Fault" (amber in color)
 - "Topps System Fault" (amber in color)
 - "Lube System Active" (amber in color)
 - "Jacks Not Stowed" (red in color)
 - "PTO Engaged" (green in color)
 - "Inter Axle Lock" (amber in color)
 - "4x4" (green in color)
 - "Driver Controlled Diff Lock" (green in color)
 - "Ok to Pump" (green in color)
 - "Auto Traction Control" (amber in color)
 - "Retarder Active" (amber in color)
 - "Auxiliary Brake Active" (amber in color).
-
- "Low Engine Coolant" indicator light and alarm

CENTER DASH EXTENSION/STORAGE MODULE

A rugged, wrap-around cab instrument panel shall be provided between the driver and officer seat positions, protruding from the center dash area over the engine enclosure. The module shall be constructed of vacuum-molded ABS and covered with a vinyl overlay. This module shall provide additional switching and function control capability for the driver and officer. The module shall be offset to the driver's side to allow map/book storage on the officer side, yet allowing for adequate elbow spacing on both sides of the module. The center console shall also provide two (2) recessed pockets to be used for radio chargers, or storage for miscellaneous items.

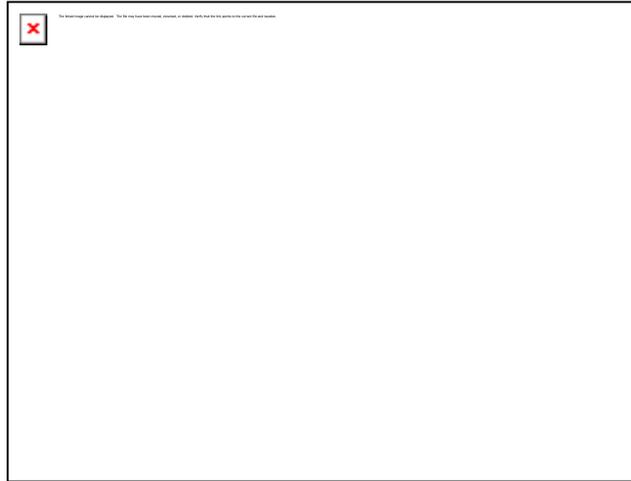


LOWER LEFT AUXILIARY SWITCH PANEL

The driver's lower left panel shall be capable of housing five (5) guarded type rocker switches. Examples of the switches that shall be installed in this area are automatic chains, fan clutch override, ATC, inter-axle diff lock, electric fuel pump, all wheel drive, etc.

PUMP SHIFT CONTROL

The pump shift control and pump engaged indicator light shall be mounted in the driver's lower left panel. This control shall be equipped with a mechanical type lock to prevent inadvertent activation or de-activation. The lever positions and indicator light shall be clearly marked.



OFFICER DASH

There shall be a flat surface area in front of the officer for use with such items as a lap top computer.

COMPUTER MOUNT

A slide-out laptop computer mount shall be provided on the Data Terminal area in front of the officer's seat.

CENTER OVERHEAD PANEL

An overhead console with a removable pewter panel shall be provided on the cab interior overhead between the driver and officer to permit installation of cab stereo, intercom systems, arrow stick controls, etc. The overhead console shall be approximately 27" wide x 4" high x 13" deep and shall be integrated into the ABS overhead center panel. The overhead console shall not obstruct the driver's vision through the officer's side window.

CLIMATE CONTROL SYSTEM

A climate-control system shall be provided for total cab environmental comfort. This system shall provide heat, cooling and defrost capabilities to various areas in the cab. The system shall consist of a single evaporator unit, mounted in the center overhead of the cab.

The ceiling mounted evaporator/heater unit shall include the following:

- Heavy-duty, high output blower.
- High efficiency coil that includes "rifled" tubing and oversized header tubes for maximum refrigerant distribution.
- Four (4) 3" diameter, adjustable louvers; two (2) each side of the cab overhead, facing the driver and officer seat positions.
- Two (2) larger louvers located in the center of the overhead assembly, facing the windshield.

- A large center mounted multi-vent defroster louver positioned above the windshield to provide adequate airflow for windshield defrost.
- Four (4) integral 3" diameter louvers, one (1) below the driver and officer seat positions and one (1) under each outboard rear facing crew seat.
- Damper controls shall be pneumatically operated to provide air discharge to the windshield, front overhead air discharge louvers or the seat riser/floor outlets as required.
- An adjustable electric water valve to control the amount of heat.
- Housing shall be fully insulated and enclosed.
- BTU: 71,000 A/C
- BTU: 85,000 Heat
- CFM: 680 Heat as mounted in the cab
- CFM: 680 A/C as mounted in the cab

The ceiling mounted evaporator unit shall be designed to include a deep well condensate collection pan, which shall include an automatic air vacuum pump to ensure proper drainage.

The ceiling mounted evaporator unit shall be enclosed with an ergonomically designed, custom padded ABS panel to provide maximum headroom and a pleasing appearance.

A serviceable foam intake filter shall be installed on the rear of the evaporator.

The controls panel shall actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve.

All defrost/heating systems will be plumbed with one (1) seasonal shut-off valve mounted near the engine.

ROOF MOUNT CONDENSER

A 12-volt roof top dual condenser shall be strategically positioned on the cab roof so as not to interfere with any emergency lighting systems. The condenser shall be designed with high performance, long life fan assemblies. The fan motors are to be equipped with sealed housings and shaft.

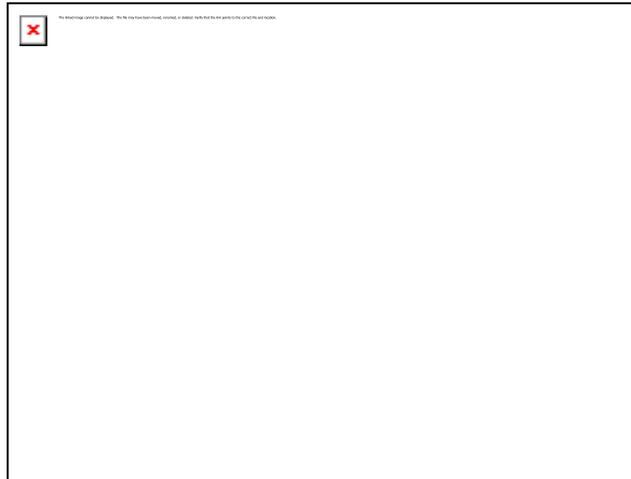
The condenser and coil design shall include rifled tubing for maximum efficiency. Each coil shall be painted black. The condenser unit must include a receiver drier with a high and low pressure switch. The wire harness shall include necessary wiring for the clutch circuit as well as a separate power relay circuit.

Mounting design shall enable easy servicing of all components and unit replacement if necessary.

The roof mounted air conditioning condenser housing(s) shall be painted to match the cab roof color.

CLIMATE CONTROL SWITCHES

The drivers overhead panel shall contain all controls for the cab climate control system. The following controls shall be provided: mode selector switch, front fan speed switch, rear fan speed switch, air conditioning on/off switch, and temperature control dial. All controls shall be clearly labeled, adequately backlit, and installed in an easily removable panel.



CAB TILT ASSEMBLY

A hydraulic cab lift system shall be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves.

The cab tilt mechanism shall be custom designed for ease of maintenance and consist of two (2) hydraulic cylinders with a maximum lift capacity of 19,625 pounds. Hydraulic lines shall be rated at 20,000 PSI burst pressure. The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

Hydraulic cylinders shall be detachable to allow removal of the engine for major service. A remote cable operated mechanical cylinder stay bar and release shall be provided to insure a positive lock in the tilted position.

The two (2) rear outboard cab latches shall be of the hydraulic pressure release, automatic re-latching type, and provide an automatic positive lock when the cab is lowered. The latch shall not disengage or experience any damage when subjected to a pull apart tensile load of 6,000 lbs. The hydraulic pressure required to unlock the latch shall not exceed 550 PSI. The latch shall withstand 5,000 PSI without leaks or damage and withstand 1,000 continuous cycles of operation under a load of 1,000 lbs at liftoff. The tilt pump shall be electric over hydraulic type, with a pressure rating of not less than 4,000 PSI. Additionally, the cab tilt device shall be both electrically and hydraulically interlocked to prevent inadvertent activation of the cab tilt system.

- A "CAB NOT LATCHED" indicator shall be provided in the cab dash-warning cluster.
- A dual switch control system shall be provided for the cab tilt, located on the passenger side of the vehicle or on the optional tether control. System shall consist of a three (3) position toggle switch along with a rubber covered push button switch.

AUXILIARY MANUAL CAB LIFT

An auxiliary manual cab lift back up system shall be furnished inside the passenger side of the pump enclosure for use in the event of total electrical shutdown.

AUDIBLE ALARM (CAB TILT)

An audible alarm shall be provided to alert the operator when the cab is being raised or lowered.

The cab tilt control shall be equipped with an interlock that shall disable the cab tilt system in the event the parking brake is not applied.

CHASSIS FRAME ASSEMBLY

The chassis frame shall be fabricated in its entirety at the manufacturer's facility. This shall prevent any split responsibility in warranty or service.

The frame shall consist of two (2) channels fastened together by cross members. All structural fasteners used in the frame shall be Grade 8 hardware. Hardened steel washers shall be used under all bolt heads and nuts to avoid stress concentrations. Top flange shall be free of bolt heads. All spring hangers shall be machined steel castings. Weldment type chassis and the use of Huck bolts shall never be used.

Each main frame rail shall be 10-1/4" x 4" x 3/8", fabricated from 110,000 PSI minimum yield steel, with a minimum section modulus of 17.97 cu in and a resisting bending moment (RBM) of 1,976,700 inch pounds.

A full length inner frame liner shall be installed. Total section modulus of each rail, with liner, shall be 31.20 cu in and the total resisting bending moment (RBM) shall be a minimum of 3,432,000 in-lbs, per rail.

The chassis frame assembly, consisting of frame rails, cross members, axles and steering gear(s), shall be finish painted before installation of any electrical wiring, fuel system components, or air system components. All components or brackets fastened to the frame rails shall be cleaned, primed and painted prior to being attached to the frame rails.

***** FRONT BUMPER, EXTENSION & ACCESSORIES *****

FRONT BUMPER

A 12" high, 101" wide, two (2) ribbed, bright finish stainless steel front bumper shall be provided. The bumper shall be a wrapped design to match the contour of the front cab sheet.

The bumper shall be extended 20" with a polished aluminum tread plate gravel shield enclosing the top and ends.

STORAGE WELL - CENTER

One (1) storage well constructed of 1/8" aluminum shall be installed in the gravel shield. This storage well shall be center mounted between the chassis frame rails. The bottom of the storage well shall have a minimum of four (4) drain holes.

One (1) hinged, latched, aluminum tread plate cover shall be installed on the storage well located in the center of the bumper extension.

CORNERING LIGHTS

A pair of Whelen #5VC03ZCR LED lights shall be provided and shall be mounted vertically, (1) one each side of the custom chassis front bumper, in a Whelen #5TSMAC chrome plated flange. The lights shall be wired to activate with the turn signals.

FRONT TOW EYES

Two (2) front chrome plated steel, tow eyes shall be fastened directly to the frame web, extending above the bumper through the aluminum tread plate gravel shield. The tow eyes shall be fastened with grade 8 bolts and nuts.

FRONT AXLE

Front axle shall be a Meritor MFS-20-133 A-N, reversed Elliott "I" beam type and include low friction "Easy Steer" bushing technology for maximum steering ease and longer life.

The front axle shall be rated at 20,000 lbs.

FRONT DISC BRAKES

Meritor EX-225 H, 17" disc brakes shall be provided for the front axle. The front brakes shall be full air actuated with automatic slack adjustment.

FRONT SUSPENSION

Front suspension shall be progressive rate front leaf springs. The spring shall be permanently pinned at the front and have a shackle double pinned mounting at the rear.

The front leaf springs shall have a minimum of 9 leaves, a minimum length of 51", and a minimum width of 3-1/2". The capacity at ground shall be 20,000 lbs., or exceed the capacity of the axle, unless specified to the contrary in this specification. All springs shall be of center bolt design. All springs shall be positively restrained from rotating in brackets and shackles.

FRONT SHOCK ABSORBERS

The front suspension system shall be equipped with Monroe, model "Magnum - 70", double acting hydraulic shock absorbers. Shock absorbers to have a minimum bore of 1.38" and an outside diameter of approximately 3-1/4".

REAR AXLE

Rear axle shall be a single, Meritor RS-30-185 with a capacity of 31,000 lbs. (Minimum). Axle shall be a single reduction axle with hypoid gearing and oil-lubricated wheels bearing. Oil seals shall be provided as standard equipment.

REAR BRAKES

Brakes shall be "S" Cam, 16-1/2" x 7" size and shall be full air actuated with automatic slack adjusters.

-

REAR AXLE TOP SPEED

The rear axle/s shall be geared for a vehicle top speed in accordance with NFPA sections 4.15.2 and 4.15.3.

Units with GVWR over 26,000 pounds shall be limited to 68 mph. If the combined tank capacity is over 1250 gallons of foam and water or the GVWR is over 50,000 pounds, the vehicle top speed shall be limited to 60 mph or the fire service rating of the tires, whichever is lower.

REAR SUSPENSION

The rear suspension shall be leaf type, variable rate with a 31,000 lb. rating. The main spring assembly shall consist of 14 leaves with the main spring measuring 60.5" L x 3" W.

There shall be a rubber block helper mounted above the leaf springs, rated at 4,500 lbs. Two (2) fully wrapped leaves shall transmit driving and braking torque. The rating shall be designed to match or exceed the rear axle. Designs allowing the main pack to float are not acceptable.

******* AIR & BRAKE SYSTEM *******

BRAKE SYSTEM

A dual circuit, air operated braking system, meeting the design and performance requirements of FMVSS -121 and the operating test requirements of NFPA 1901 current edition shall be installed. It shall be direct air type with dual air treadle in the cab. The system shall be powered by an engine mounted, gear driven air compressor protected by a heated air dryer.

The air system shall be plumbed with reinforced, air brake tubing/hose in conformance to SAE J 844-94, Type B and U.S.D.O.T. standards. The compressor discharge shall be plumbed with stainless steel braided hose lines with a Teflon lining. Eaton Synflex Eclipse Air Brake tubing shall be run along the inside frame rails and connected with Eaton Q-CAB 217 series fittings that meet or exceed all industry standards. All Synflex tubing shall be secured with non-conductive, corrosion resistant strapping mounted with standoff fasteners. Cord reinforced rubber hose lines with brass fittings shall be installed from the frame rails to axle mounted air connections.

The air system shall provide a rapid air build-up feature and low-pressure protection valve with light and buzzer, designed to meet the requirements of NFPA 1901, current edition.

ABS SYSTEM

An Anti-Skid Braking System (ABS) shall be provided to improve braking control and reduce stopping distance. This braking system shall be fitted to all of the axles. All electrical connections shall be environmentally sealed, water, weatherproof, and vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel shall transmit wheel speed data to an electronic processor which shall sense approaching wheel lock causing instant brake pressure modulation up to 5 times per second in order to prevent wheel lockup. Each wheel shall be individually controlled.

To improve service trouble shooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started. A dash-mounted light shall go out once the vehicle has attained 4 mph after successful ABS start-up. To improve field performance; the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, the defective circuit shall revert to normal braking action. A

The chassis air system shall meet NFPA 1901, latest edition for rapid air pressure build-up within sixty (60) seconds from a completely discharged air system. This system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the sixty (60) seconds build-up time.

BRAKE TREADLE VALVE

A Bendix dual brake treadle valve shall be mounted on the floor in front of the driver. The brake control shall be positioned to provide unobstructed access and comfort for the driver.

PARKING BRAKE

Parking brake shall be of the spring-actuated type, mounted on the rear axle brake chambers. The parking brake control shall be mounted on the cab center instrument panel, offset toward the driver. A red indicator light shall be provided in the driver dash panel that shall illuminate when the parking brake is applied.

AUXILIARY AIR INLET/AUTO EJECT

A Kussmaul Auto Air Eject #091-28 inlet shall be provided on the driver side of the cab, exact location to be determined at a later date. The Air Eject shall be mounted using a Kussmaul Weatherproof Adapter Kit #091-28AK.



The Kussmaul air-eject connection shall be equipped with a White weatherproof cover.



The air eject shall be located in the area directly adjacent to the driver's side cab door, above the side air grille.

FRONT WHEELS & TIRES

The front wheels shall be 22.5" x 12.25" ten stud, hub piloted, DuraBright aluminum disc type.

The aluminum disc front wheels shall be provided with bright nut covers and hub caps.

The front tires shall be Michelin 425/65R22.5 "20 Ply" tubeless radial XZY3 wide base mixed tread. The tires shall be fire service rated up to 24,400 lbs and shall have a top speed of 65 mph when inflated to 120 psi.



Fire Service Rating means operations not to exceed one hour loaded travel at maximum speed, with at least a one hour cool down prior to another loaded run.

Industry load and inflation standards are in a constant state of change. Printed material may not reflect the latest load and inflation standards.

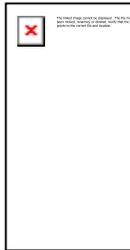
NOTE : NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION.

REAR WHEELS & TIRES

The single rear axle wheels shall be 22.5" x 9" ten stud, hub piloted, DuraBright aluminum disc type.

The single rear axle aluminum disc wheels shall be provided with bright nut covers and hub caps.

The rear tires shall be Michelin 315/80R22.5 "20 Ply" tubeless radial XDY3 traction tread. The tires shall be fire service rated up to 33,500lbs and shall have a top speed of 60 mph when inflated to 130 psi.



Fire Service Rating means operations not to exceed one hour loaded travel at maximum speed, with at least a one hour cool down prior to another loaded run.

Industry load and inflation standards are in a constant state of change. Printed material may not reflect the latest load and inflation standards.

NOTE : NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION.

TIRE PRESSURE MONITORING DEVICES

Each tire shall be equipped with an air pressure indicator cap on the valve stem. Each cap shall have a visual LED indicator to show if the tire is correctly inflated.

***** ENGINE, TRANSMISSION & ACCESSORIES *****

ENGINE

Engine shall be a Cummins, 2010 Model ISX 11.9 500, diesel, turbo-charged, per the following specifications.

- Max. Horsepower 500 HP @ 1800 RPM
- Governed Speed 2100 RPM
- Peak Torque 1645 lb. ft. @ 1200 RPM
- Cylinders Six (6)
- Operating Cycles Four (4)
- Bore & Stroke 5.11 x 5.91 in.
- Displacement 729 cu. in.
- Compression Ratio 17.1:1
- Governor Type Limiting Speed
- Drive line Size 1810 Series.

Engine oil filters shall be engine manufacturers branded or approved equal. Engine oil filters shall be accessible for ease of service and replacement.

A fuel/water separator shall be provided.

ENGINE BASE WARRANTY

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

ENGINE CHASSIS CERTIFICATION

The engine shall be installed in accordance with engine manufacturer's instructions. KME shall be able to furnish proof of engine installation approval by the engine manufacturer.

COOLING/RADIATOR

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system standards.

To provide maximum corrosion resistance and cooling performance, the entire radiator core shall be constructed using long life aluminum alloy. The core shall be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes shall be brazed to aluminum headers. No solder joints or leaded material of any kind shall be acceptable in the core assembly.

The radiator core shall have a height of 35.92" x a width of 37.62". Supply and return tanks made of glass-reinforced nylon shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator shall be compatible with commercial antifreeze solutions.

There shall be a full steel frame around the entire radiator core assembly. The radiator core assembly shall be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator shall be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly shall be isolated from the chassis frame rails with rubber isolators.

The cooling system shall include a surge tank mounted to the top of the radiator framework that shall remove air in the system. The surge tank shall be equipped with a sight glass to monitor the level of coolant. The radiator shall be equipped with a dual seal cap that shall allow for expansion and recovery of coolant into a separate integral chamber.

The cooling system shall be designed for a maximum of fifteen (15) PSI operation.

A drain port shall be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

Extended life engine coolant shall provide anti-freeze protection to -30° F. The mixture shall be per the engine manufacture's specifications.

The engine cooling system shall have an inline coolant filter that shall have a shut off valve for ease of maintenance.

The engine cooling system shall be certified by the engine manufacturer to meet cooling index requirements for a minimum ambient temperature or 110-degrees Fahrenheit.

TRANSMISSION COOLER

A shell and tube transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature. The cooler shall have an aluminum shell and copper tubes. The cooler shall be assembled using pressed in rubber tube sheets to mechanically create a reliable seal between the coolant and the oil. No brazed, soldered, or welded connections shall be used to separate the coolant from the oil.

RADIATOR SKID PLATE

The radiator installation shall include a heavy-duty radiator skid plate to protect the radiator from debris or obstructions under the chassis. The skid plate shall be designed so the angle of approach is not affected.

CHARGE AIR COOLER

The charge air cooler shall be constructed of aluminum with cast aluminum side tanks. To not restrict air flow to the radiator, the charge air cooler shall be designed to be an integral part of the radiator assembly, mounted directly on top of the radiator. Rubber isolators shall be used at the mounting points to reduce transmission of vibrations.

Where applicable, the charge air cooler pipes shall be constructed of appropriately sized aluminized steel tubing with 0.06" wall thickness and formed hose barbs. The connections between these pipes, the engine and charged air cooler, shall be made using high temperature silicone hoses rated for use in temperature up to 500°F, and heavy duty constant tension T-Bolt spring hose clamps. These connections shall adequately allow for movement of the engine relative to the charged air cooler.

Charge air coolers that are located in front of the radiator, that block or restrict air flow into the engine radiator or introduce above ambient temperature air into the radiator in any way shall not be used.

COOLING SYSTEM FAN

The engine cooling system shall incorporate a heavy duty fan, installed on the engine and include a shroud.

The fan shall be equipped with an air operated clutch fan, which shall activate at a pre-determined temperature range.

Re-circulation shields shall be installed to ensure that air which has passed through the radiator is not drawn through it again.

COOLANT HOSE AND PIPING

All coolant piping shall be constructed of appropriately sized powder coated steel tubing with 0.06" wall thickness and formed hose barbs. All connections between coolant pipes and chassis components shall be made using appropriately sized silicone hoses or elbows, rated for use in temperatures ranging from -60°F to +350°F, and appropriately sized stepless constant torque hose clamps. These connections shall be minimal in number to reduce the number potential leak points, and shall adequately allow for movement of the engine relative to chassis mounted components. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

HEATER HOSES

Premium Goodyear Hi-Miler® blue heater hoses shall be furnished for the heater system. The Hi-Miler® hose shall have a core of black Versigard (EPDM) with spiral flextan reinforcement and blue Versigard coating. All heater hoses shall be equipped with constant torque type hose clamps. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

LOW COOLANT INDICATOR LIGHT AND ALARM

A low engine coolant indicator light located in the dash instrument panel shall be provided. An audible alarm shall be provided to warn of the low coolant condition.

ENGINE BRAKE

An engine compression brake shall be furnished for increased braking capabilities. Controls shall be as provided by the engine manufacturer and shall be activated by releasing the throttle pedal to the idle position.

The engine compression brake shall have dash mounted control switches to turn the brake on or off as well as to control the operational level of the brake.

The engine brake shall be wired in such a manner so as to illuminate the chassis brake lights when the engine brake is engaged and operating.

The engine brake shall be interlocked with the PTO operation and shall automatically disengage any time the apparatus is operating with the PTO active.

ENGINE FAST IDLE

A fast idle for the electronic controlled engine shall be provided. The fast idle shall be controlled by an ON/OFF switch on the dash.

An electronic interlock system shall prevent the fast idle from operating unless the transmission is in "Neutral" and the parking brake is fully engaged. If the fast idle control is used in conjunction with a specified engine/transmission driven component or accessory, the fast idle control shall be properly interlocked with the engagement of the specified component or accessory.

AIR CLEANER

An engine air cleaner shall be provided. The air cleaner shall include a dry type element and shall be installed in accordance with the engine manufacturer's recommendations. The air cleaner shall be located to the rear of the engine, with streamline air pipes and hump hose connections from the inlet to the air cleaner and from the air cleaner to the turbo. The air cleaner shall be easily accessible when the cab is tilted. The air cleaner shall be plumbed to the air intake system that shall include a self sealing connection between the cab and air cleaner assembly to allow the cab to be tilted.

SPARK ARRESTOR

A spark arrestor shall be installed in the chassis air intake system. This arrestor shall be mounted behind the intake grille to filter out airborne embers. The spark arrestor housing must be easily accessible when the cab is tilted.

ACCELERATOR CONTROL

A floor mount accelerator pedal shall be installed on the floor in front of the driver. The pedal shall be positioned for comfort with ample space for fire boots and adequate clearance from the brake pedal control.

REMOTE THROTTLE CONTROL HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection to required throttle control harnesses. The harness shall contain necessary connectors for a pressure governor and a multiplexed gauge. Separate circuits shall be included for pump controls, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate "Pump Engaged" and "OK to Pump" indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

TRANSMISSION

An Allison World Transmission, Model 4000 EVS electronically controlled, automatic transmission shall be provided. Transmission specifications shall be as follows:

- Max. Gross Input Power 600 HP
- Max. Gross Input Torque 1850 lb. ft.
- Input Speed (Range) 1700- 2300 RPM
- Direct Gear (Pumping) 4th (Lock-up)

Transmission installation shall be in accordance with the transmission manufacturer's specification. The transmission shall be readily and easily removable for repairs or replacement.

One (1) PTO opening shall be provided on both the left and right side of the converter housing (positions one (1) o'clock and eight (8) o'clock).

The transmission shall be calibrated for five (5) forward gears and one (1) reverse gear. Each gear shall have the following ratios:

- First 3.51:1
- Second 1.91:1
- Third 1.43:1
- Fourth 1.00:1
- Fifth 0.74:1
- Reverse -4.80:1

An illuminated, touch-pad type shift control shall be mounted in the cab, convenient to the driver. Shift control shall be approved by the transmission manufacturer.

Transmission is to be programmed with aggressive down shift to 2nd Gear.

TRANSMISSION OIL LEVEL SENSOR

The transmission shall be equipped with the oil level sensor (OLS); this sensor shall allow the operator to obtain an indication of the fluid level from the shift selector. The sensor display shall provide the following checks, correct fluid level, low fluid level and high fluid level.

PARK TO NEUTRAL

The transmission, upon application of the parking brake, shall automatically shift into neutral.

PRESELECT PROGRAMMING

The transmission shall have Allison Preselect enabled to automatically downshift when the secondary engine brake is active.

The transmission shall be programmed at the factory to automatically downshift to 4th gear.

This feature shall be enabled/disabled with the main on/off switch for the engine brake.

TRANSMISSION FLUID

TES-389 transmission fluid shall be utilized to fill the 4000 EVS transmission.

DRIVE LINES

Drive lines shall be Dana (Spicer) 1810 heavy duty series or equal, with "glide coat" splines on all slip shafts. The chassis manufacturer shall utilize an electronic type balancing machine to statically and dynamically balance all drive shafts. The manufacturer shall provide proof of compliance with all drive shaft manufacturer's standards and specifications.

DIESEL EXHAUST FLUID TANK

A five (5) gallon diesel exhaust fluid (DEF) tank shall be provided and installed. The tank shall be mounted in the area of the battery box and shall be accessible through a door in the crew area step well.

The tank shall include an internal heater that will be fed by engine coolant directly from the engine block to ensure it is always kept at the proper temperature per EPA requirements. The tank shall include a temperature sensor to control the flow of the engine coolant from the heater valve to the DEF tank.

A DEF fluid level sensor shall be provided with the DEF tank and connected to the level gauge on the dashboard.

EXHAUST SYSTEM

The exhaust system shall be installed in accordance with the engine manufacturer's requirements and meet all Environmental Protection Agency and State noise level requirements. Exhaust system components shall be securely mounted and easily removable.

The diesel particulate filter/muffler shall be fabricated from stainless steel and of a size compatible with the engine exhaust discharge.

Exhaust tubing shall be a minimum of 16 gauge stainless steel from the turbocharger on the engine to the inlet of the diesel particulate filter. Any flexible exhaust tubing shall be HDT stainless steel type. To minimize heat build-up, exhaust tubing within the engine compartment shall be wrapped with an insulating material. Exhaust shall be wrapped from the turbocharger to the entrance of the muffler. Material shall be held in place with worm gear type clamps.

An exhaust diffuser shall be provided to reduce the temperature of the exhaust as it exits the tailpipe.

Separate "regeneration" enable and prohibit switches shall be provided under the dash board on the driver's side. Each switch shall be provided with a spring loaded protective cover and shall be clearly marked as to function.

SELECTIVE CATALYTIC REDUCTION (SCR)

The vehicle shall be equipped with SCR technology that uses a urea based diesel exhaust fluid (DEF) and a catalytic converter to significantly reduce oxides of nitrogen (NOx) emissions.

The SCR system shall reduce levels of NOx (oxides of nitrogen emitted from engines) by injecting small quantities of diesel exhaust fluid (DEF) into the exhaust upstream of a catalyst, where it vaporizes and decomposes to form ammonia and carbon dioxide. The ammonia (NH₃), in conjunction to the SCR catalyst, converts the NOx to harmless nitrogen (N₂) and water (H₂O).

The exhaust tailpipe extending from the SCR catalyst to the side of the vehicle shall be constructed from 16-gauge aluminized steel tubing. The exhaust discharge shall be on the officer side of the apparatus forward of the rear axle.

****** FUEL SYSTEM ******

FUEL TANK

Fuel tank shall be a minimum of sixty-five (65) gallon capacity. It shall have a minimum fuel filler neck of 2" ID. A 1/2" minimum diameter drain plug shall be provided. The tank shall be fabricated from stainless steel. Provisions for an additional feed line and fuel level float shall be provided for future use.

The fuel tank shall be installed behind the rear wheels between the frame rails.

The fuel tank shall meet all FHWA 393.67 requirements including a fill capacity of 95% of tank volume.

The fuel tank shall be able to withstand a longitudinal acceleration of -23.0g at 0.166 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter. Testing shall be performed at and verified by a third party testing and evaluation center.

FUEL TANK STRAPS

The straps supporting the diesel fuel tank shall be made of Type 304L stainless steel with stainless steel hardware.

The fuel lines shall be textile reinforced synthetic rubber or plastic hose that is approved for use with diesel fuel and has a minimum max temperature rating of 250° F. The lines shall be sized to meet engine manufacturer's requirements, and shall be carefully routed and secured along the inside of the frame rails.

FUEL FILTER/WATER SEPARATOR

A fuel filter/water separator shall be provided in the fuel system. A "water in fuel" indicator shall be provided on the dash.

SECONDARY ELECTRIC FUEL PUMP

In addition to the primary fuel pump, a secondary electric fuel pump for re-priming shall be furnished in the main fuel line. A labeled control switch shall be provided on the main dash panel.

FUEL POCKET

A fuel fill shall be provided in the left side rear wheel well area. A Cast Products heavy duty cast aluminum spring loaded hinged fill door shall be provided.

A label indicating "Ultra Low Sulfur Diesel Fuel Only" shall be provided adjacent to the fuel fill.

A polished stainless steel trim panel shall be provided around the fuel fill door on the side of the body panel.

DUAL POWER STEERING

A dual power steering system shall be provided utilizing a Sheppard model #M110 main steering gear on the driver side of the chassis and a Sheppard model #M90 assist steering gear on the officer side of the chassis.

The power steering gear on the officer side of the chassis shall increase performance in turning the officer side wheel assembly, reducing loads and forces on the main gear and components.

The steering system shall be designed to maximize the turning capabilities of the front axle no matter the rating and tire size. The use of a power assist cylinder on the officer side of the chassis is NOT ACCEPTABLE on front axles of this capacity.

The system shall be designed utilizing an engine driven hydraulic pump, with a maximum operating pressure of 2000 PSI. Steering design shall permit a maximum of 5.6 turns from stop to stop. Steering system components shall be mounted in accordance with the steering gear manufacturer's instructions.

STEERING COLUMN

The steering column shall be a "Douglas Autotech" tilt and telescope column. A lever mounted on the side of the column shall control the tilt and telescope features.

The steering shaft from the column to the miter box shall have a rubber boot to cover the shaft slip and a second rubber boot to seal the passage hole in the floor.

There shall be a self-canceling, directional signal lever. windshield wiper / wash controls and traffic hazard switch on the steering column. The high beam activator shall be controlled by pulling the directional signal lever toward the driver.

SMARTWHEEL STEERING WHEEL

The steering column shall be a "Smart Wheel" multiplexed steering wheel. The "Smart Wheel" shall be designed so that the driver's hands never need to leave the steering wheel once the engine is running and the parking brake is released.

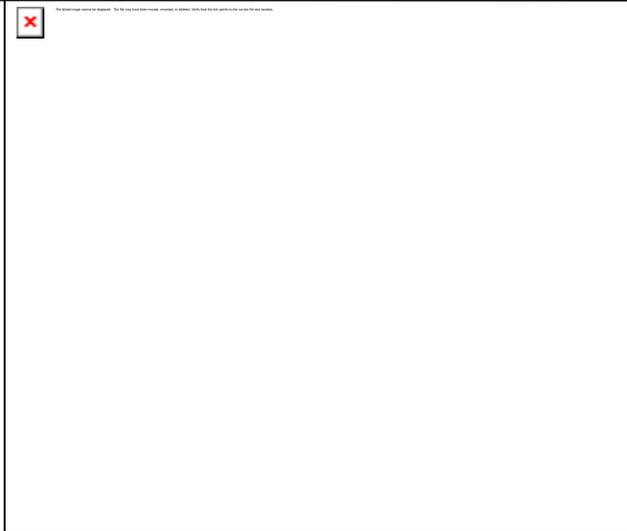
The "Smart Wheel" steering wheel shall include ten (10) multiplexed switches that control the following functions:

- Air Horn
- Electric Horn
- Q2B (If Equipped)
- Q2B Brake (If Equipped)
- Master Warning Switch
- Mic (Push to talk)
- Siren
- Auxiliary Braking
- Cruise/Throttle Up
- Cruise/Throttle Down
- Cruise Set

The functions shall be multiplexed through a clock spring circuit board. Collector rings switch wiring is not acceptable! The steering wheel shall be 18 inches in diameter.

The turn signal switch shall include the following functions:

- Left and right turn signals
- High beam dimmer control
- Hazard warning switch
- Two speed with intermittent windshield wiper control
- Windshield washer control



4FRONT® - FRONTAL AIR BAG PROTECTION

The cab will be equipped with a frontal impact protection system consisting of one (1) air bag in front of the driver in the steering wheel. The steering wheel air bag shall be designed to protect the driver in the event of a frontal or oblique impact.

The driver seat shall be equipped with a S4 pretensioner for suspension seat (if required) and a seat belt pretensioner.

4FRONT® - FRONTAL AIR BAG PROTECTION FOR OS KNEE BOLSTER

Frontal impact protection system consisting of one (1) knee bolster air bag, in front of the officer mounted in the firewall panel below the dash panel. The officer seat will be equipped with a S4 pretensioner for a suspension seat (if required) and a seat belt pretensioner.

The officer side knee bolster air bag shall be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact.

The frontal air bag system shall be designed specifically for the cab configurations they are used in. The cab and chassis design shall have been subjected, via third party test facility, to a 21 MPH crash impact during frontal and oblique impact testing. Testing shall include all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspension components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing shall provide configuration specific information used to optimize the timing for firing the air bags.

The driver side air bag shall be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact. The passenger side knee bolster air bag shall be mounted in the modesty panel below the dash panel and shall be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact.

In the event of a frontal or oblique impact, the system shall deploy air bag/s, and activate the following components integrated into seating position equipped with an air bag:

Suspension seats will be retracted to lowest travel position. Seat belts will be pretensioned to firmly hold the occupants in place.

ROAD SAFETY KIT

A road safety kit shall be furnished with the following equipment:

- 2 1/2 lb. B-C fire extinguisher
- Triangle safety reflectors.

SIGNBOARD - WINDSHIELD

KME will provide in illuminated signboard 'WESTFIELD ENGINE 82' in the lower portion of the windshield. It will be wired to the headlight circuit unless otherwise directed by the department.

******* CHASSIS/BODY ELECTRICAL & ACCESSORIES *******

CHASSIS ELECTRICAL SYSTEM

All electrical wiring in the chassis shall be SXL cross link insulated type. Wiring is to be color coded and include function codes every three (3) inches on both sides. Wiring harnesses shall be routed in protective, heat resistant loom, securely and neatly installed. Two (2) power distribution centers shall be provided in central locations for greater accessibility. The power distribution centers shall contain automatic thermal self resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays shall have a capacity substantially greater than the expected load on the related circuit, thus ensuring long component life. Power distribution centers shall be composed of a system of interlocking plastic modules for ease of custom construction.

The power distribution centers shall be function oriented. The first is to control major truck function. The second control center shall enable overhead switching and interior operations. Each module shall be single function coded and labeled to aid in troubleshooting. The centers will also have accessory breakers and relays for future installations. All harnesses and power distribution centers shall be electrically tested prior to installation to ensure the highest system reliability.

All external harness interfaces shall be of a triple seal type connection to ensure a proper connection. The cab/chassis and the chassis/body connection points shall be mounted in accessible locations. Complete chassis wiring schematics shall be supplied with the apparatus.

WIRING HARNESS DESCRIPTION

The wiring harness contained on the chassis shall be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit is protected without exceeding 10% voltage drop across the circuit. Wiring will be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall be referenced on a wiring diagram. All wires conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).

The covering of harnesses shall be moisture resistant loom with a minimum rating of 289 Degrees Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable shall have a minimum rating of 289 degree Fahrenheit.

All harnesses will be securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations shall use a method that provides a positive mechanical and electrical connection and are in accordance with the device manufacturer's instructions. No connections within the harness may utilize wire nut, insulation displacement, or insulation piercing components.

All circuits shall conform to SAEJ1292. All circuits will be provided with low voltage over current protective devices. These devices shall be readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers shall not be used for ground connections.

DIRECT GROUNDING STRAPS

Direct grounding straps shall be mounted to the following areas; frame to cab, frame to body and frame to pump enclosure.

All exposed electrical connections shall be coated with "Z-Guard 8000" to prevent corrosion.

EMI/RFI PROTECTION

The apparatus shall incorporate the latest designs in the electrical system with state of the art components to insure that radiated and conducted electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source.

The apparatus proposed shall have the ability to operate in the environment typically found in fire ground operations with no adverse effects from EMI/RFI.

EMI/RFI susceptibility is controlled by utilizing components that are fully protected and wiring that utilizes shielding and loop back grounds where required. The apparatus shall be bonded through wire braided ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode protected to prevent transient voltage spikes.

In order to fully prevent the radio frequency interference the purchaser may be requested to provide a listing of the type, power output, and frequencies of all radio and bio medical equipment that is proposed to be used on the apparatus.

12 VOLT ELECTRICAL SYSTEM TESTING

The apparatus low voltage electrical system shall be tested and certified by the manufacturer. The certification shall be provided with the apparatus. All tests shall be performed with air temperature between 0°F and 100°F.

The following three (3) tests shall be performed in order. Before each test, the batteries shall be fully charged.

TEST #1-RESERVE CAPACITY TEST

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

TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE

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

TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD

The total continuous electrical load shall be activated with the engine running up to the engine manufacturers governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded due to excessive battery discharge, as detected by the system, or a system voltage of less than 11.7 volts DC for a 12 volt system, for more than 120 seconds, shall be considered a test failure.

LOW VOLTAGE ALARM TEST

Following completion of the preceding tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm is activated.

The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts shall be considered a test failure. The battery system shall then be able to restart the engine.

At time of delivery, documentation shall be provided with the following information:

- Documentation of the electrical system performance test
- A written load analysis of the following;
- Nameplate rating of the alternator
- Alternator rating at idle while meeting the minimum continuous electrical load
- Each component load comprising the minimum continuous electrical load.
- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

MULTIPLEX ELECTRICAL SYSTEM WITH COLOR DISPLAY

A Weldon style V-MUX Multiplex System shall be provided. The V-MUX shall provide an on-board diagnostics and status, increase reliability and durability, minimize downtime, supply reverse polarity protection and dramatically simplify troubleshooting and repairs for the vehicle. It shall provide short and open circuit detection and notification, on board service information and reduce splices by 80-90%. Each node shall enable discrete load shedding, sequencing, diagnostics and PWM control. All V-MUX hardware shall be rated for -40° to +85° C.

A series of Multiplexing Input/Output Modules shall be installed. The Input/Output modules shall permit the multiplexing system to reduce the amount of wiring and components used as compared to non-multiplexed apparatus. These modules shall vary in I/O configuration, be waterproof allowing installation outside of enclosed areas and shall possess individual output internal circuit protection. The modules shall also have three status indicators visible from a service persons vantage point that shall indicate the status of the module. In the event a load requires more than 7.5 AMPS of operating current, the module shall activate a simple relay circuit integral to any of the 3 pillbox assemblies installed in the cab.

V-MUX integration shall be available for:

- System Voltage Meter
- Ammeter
- Emergency Flasher
- Headlamp Flasher
- Load Management
- Load Sequencer
- Back-Up Monitor

- Relays
- Circuit Breakers
- Door "Open" System
- Interlock Modules
- Engine Monitor Devices
- Separate Interlock Control
- Special Waterproof Enclosures

The Vista III touch screen display node shall include the following features:

- Outside temperature display.
- A real time clock with display.
- Four (4) programmable video inputs.
- A useable temperature range from -40 degrees to 185 degrees F.
- Unlimited virtual switches.
- Selectable font sizes, types and colors for optimum user efficiency.
- Selectable color buttons and screen backgrounds.

All wiring to be appropriate gauge cross link with 311 degree F. insulation. All wires in the chassis shall be circuit numbered and function coded, in addition the SAE wiring shall be color coded. The wiring shall be protected by 275 degree F. minimum high temperature flame retardant loom as required.



ADDITIONAL WELDON V-MUX DISPLAY ON OFFICER SIDE OF CAB

An additional Weldon V-Mux Vista III touch screen display shall be recessed mounted on the officer side of the cab. The second display shall have the ability to perform and display all the same functions and information of the main display located on the driver side of the cab.

V-MUX REAR & SIDE VISION CAMERAS

Two (2) Weldon V-Mux camera kits shall be provided and installed one at the rear of the apparatus and one on the officer side of the apparatus located on the cab. The video output from each camera shall have the ability to be displayed on the Vista display panel.

MODEM TRANSCEIVER

A Weldon V-Mux modem transceiver #6120-0000-00 shall be installed to allow remote diagnostics using a phone line to connect to the vehicles electrical system.

INTERLOCK INTERFACE MODULE

A Vocation Module, which is the interface between the multiplexing system and the pump system shall be provided. This module shall serve as the interface between the operator, engine, transmission and pumping system. The module shall be installed under the driver's side dash, in a sealed enclosure that shall possess green indicating LED's that shall indicate to service personnel the interlock state of the apparatus. In the event of a multiplexing error involving pump operation can be activated to ensure reliable pumping operations at ALL times. In addition to controlling pump function, this vocation module

shall be able to provide automatic and/or manual activation of engine "Fast Idle", to maintain adequate alternator output and thus, chassis voltage.

CHASSIS DIAGNOSTICS SYSTEM

Diagnostic ports shall be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic system shall include the following:

- A single port to monitor the engine, transmission and ABS system and diagnostics of the roll sensor (if applicable)
- Engine diagnostic switch (blink codes)
- ABS diagnostic switch (blink codes)
- Allison Transmission Codes (through touch pad shifter)

WELDON V-MUX DIAGNOSTICS SYSTEM

VOLTAGE MONITOR SYSTEM

A voltage monitoring system shall be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system shall provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm shall activate if the system falls below 11.8 volts DC for more than two (2) minutes.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

A system shall be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

12 VOLT SEQUENCER

A sequencer shall be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation shall allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

Emergency light sequencing shall operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights shall be activated one by one at half second intervals. Sequenced emergency light switch indicators shall flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer shall deactivate the warning light loads in the reverse order.

Rear of cab Air-Conditioning and Heat shall be load managed.

ELECTRICAL HARNESS REQUIREMENT

To ensure dependability, all 12-volt wiring harnesses installed by the manufacturer shall conform to the following specifications:

- SAE J 1128 - Low tension primary cable
- SAE J 1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J 163 - Low tension wiring and cable terminals and splice clips
- SAE J 2202 - Heavy duty wiring systems for on-highway trucks
- NFPA 1901 - Standard for automotive fire apparatus
- FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses
- SAE J 1939 - Serial communications protocol
- SAE J 2030 - Heavy-duty electrical connector performance standard
- SAE J 2223 - Connections for on board vehicle electrical wiring harnesses
- NEC - National Electrical Code
- SAE J 561 - Electrical terminals - Eyelet and spade type
- SAE J 928 - Electrical terminals - Pin and receptacle type A.

For increased reliability and harness integrity, harnesses shall be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes is never allowed at the manufacturer.

Wiring shall be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wire colors shall be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires shall not be allowed. Function and number codes shall be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors shall be protected by a wire conduit to protect the wiring. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines:

- All holes made in the roof shall be caulked with silicon. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.
- Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance shall be quickly accessible. For ease of use, a coil of wire shall be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- Corrosion preventative compound shall be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation of the plug.
- Any lights containing non-waterproof sockets in a weather-exposed area shall have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas shall have protective coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps shall be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields shall be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust shall be protected by a heat shield.
- Cab and crew cab harnessing shall not be routed through enclosed metal tubing. Dedicated wire routing channels shall be used to protect harnessing therefore improving the overall integrity of

the vehicle electrical system. The design of the cab shall allow for easy routing of additional wiring and easy access to existing wiring.

- All standard wiring entering or exiting the cab shall be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer shall conform to the following requirements:

- SAE J 1127 - Battery Cable
- SAE J 561 - Electrical terminals, eyelets and spade type
- SAE J 562 - Nonmetallic loom
- SAE J 836 A - Automotive metallurgical joining
- SAE J 1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
- NFPA 1901 - Standard for automotive fire apparatus.

Battery cables and battery cable harnessing shall be installed utilizing the following guidelines:

- Splices shall not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables shall be color coded. All positive battery cables shall be marked red in color. All negative battery cables shall be black in color.
- For ease of identification, all positive battery cable isolated studs throughout the cab and chassis shall be red in color.
- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus shall be coated to prevent corrosion.
- An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

ALTERNATOR

There shall be a Leece Neville Model 4949PA, 270 amp, serpentine belt driven alternator or equivalent. The installation shall include a brush less design with an integral self-diagnostic regulator and rectifier for compact installations.

The alternator installation shall be designed to provide maximum output at engine idle speed to meet the minimum continuous electrical load of the apparatus as required.

BATTERY SYSTEM

Five (5) Exide #HP-31D, Group 31, maintenance free batteries shall be provided. Each battery shall be rated at 925 CCA at 0° F and shall have a reserve capacity of 180 minutes.

Wiring for the batteries shall be 4/0 welding type dual path starting cables for SAEJ541.

BATTERY STORAGE

Batteries shall be securely mounted in fixed 3/16" GR50 steel trays located on each side of the chassis frame. Complete access shall be provided when the cab is fully tilted. Batteries shall be mounted on non-corrosive matting material.

The battery tray shall be able to withstand a longitudinal acceleration of -46.5g at 0.246 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter. Testing shall be performed at and verified by a third party testing and evaluation center.

BATTERY BOX COVER

The battery box shall be overlaid with an "L" shaped, polished aluminum tread plate cover. This cover shall protect the batteries from road spray, snow and road debris. The cover of this box shall be easily removable for inspection, testing and maintenance of the batteries.

BATTERY DISCONNECT SWITCH

The chassis batteries shall be wired in parallel to a single 12 volt electrical system, controlled through a heavy duty, rotary type, master disconnect switch. The master disconnect switch shall be located within easy access of the driver upon entering or exiting the cab.

BATTERY JUMPER STUDS

A set of Cole Hersee battery jumper studs, model #46210-02 (red) and #46210-03 (black) shall be provided to allow the battery system to be jump started or charged from an external source. The studs shall be located on the bottom of the battery box on the driver's side of the chassis. Each stud shall be equipped with both a rubber protector cap and a 2" square non-conductive plate to prevent accidental shorting.

120 VOLT SHORELINE CONNECTION - "SUPER 30" AUTO EJECT

One (1) Kussmaul "Super 30" Auto Eject model 091-159-30-120, automatic, 120 volt, 30 amp shoreline disconnect shall be provided for the on board, 110 volt battery charging systems.

The disconnect shall be equipped with a three pin female receptacle, which shall automatically eject the shoreline when the vehicle starter is energized. A label shall be provided indicating voltage and amperage ratings.



SHORELINE POWER INLET PLATE

A shoreline power receptacle information plate shall be permanently affixed at or near the power inlet. The plate shall indicate the following;

- Type of Line Voltage
- Current Rating in Amps Power Inlet Type (DC or AC).

The Kussmaul auto-eject connection shall be equipped with a Red or other Department directed color weatherproof cover.



The shoreline receptacle shall be located in the area directly adjacent to the driver's side cab door.

BATTERY INVERTER/CHARGER SYSTEM

The chassis shall be equipped with A ProMariner, TruePower 2000PS, fully automatic battery inverter/charger. The unit shall contain a 70 amp, fully automatic battery charger to re-charge and maintain the chassis batteries when the shoreline connection has been made. The battery charger features an Intelligent Self Calculating Absorption/Conditioning mode that automatically programs charge/conditioning time based on the discharge status of the batteries, resulting in a 100% charge and extending battery life.

The unit shall also contain a built in inverter capable of providing 2,000 watts of continuous AC power and a 6,000 watt surge capacity. The unit shall have a built in 30 amp transfer switch capable of diverting AC power to AC loads during shoreline connection.

The inverter/charge shall also have a cab dash mounted Deluxe Remote capable of indicating the shoreline connection, inverter status and faults as well as an ON/OFF/STANDBY switch for the inverter.



OUTLET STRIP

One (1) 3' long outlet strip shall be installed in the EMS / Overhead compartment. Each outlet strip shall have four (4) duplex household receptacles.

"LED" CAB INTERIOR LIGHTING

Four (4) Akron 8080-8000-13 interior LED combination red/white dome lights shall be furnished in the cab, two (2) in the forward section and two (2) in the rear crew section. Each dome light shall have an integral selector switch. Each dome light shall also activate when the respective, adjacent cab door is opened.

CAB MAP LIGHT

A Sunnex model # 700 high intensity, goose neck map light shall be furnished and located at the right side of the cab dash.

HAND HELD SPOTLIGHT

An Optronics # KB-4001 "Blue Eye" hand-held spotlight shall be provided, it shall have a coil-cord, a momentary switch and a 400,000 candle power lamp.

"DO NOT MOVE APPARATUS" WARNING LIGHT WITH AUDIBLE ALARM

A 1" round, red flashing warning light with an integral audible alarm, shall be functionally located in the cab to signal when an unsafe condition is present such as an open cab door or body compartment door, an extended ladder rack, a deployed stabilizer, an extended light tower or any other device which is opened, extended or deployed which may cause damage to the apparatus if it is moved.

This light shall be activated through the parking brake switch to signal when the parking brake is released. This light shall be labeled "DO NOT MOVE TRUCK".

12 VOLT POWER PORT

Two (2) 12 volt power port accessory outlet(s) shall be installed in the cab of the truck for the fire departments accessory devices. The lighter(s) shall be located in the rear EMS compartment, as directed, for devices such as cellular phones.

12 VOLT ACCESSORY CIRCUIT - CAB DASH

One (1) dedicated circuit; 12 volt, 40 Amp, power and ground on 3/8 stud and fused at battery shall be provided in the cab dash. The circuit shall be for future installation of radios or accessories.

12 Volt Power and Ground for Accesories

12 VOLT ACCESSORY CIRCUIT - CREW CAB AREA

A dedicated 12 volt power and ground circuit shall be provided in the rear crew area as required. The circuit shall be for future installation of radios or accessories.

ASA VOYAGER DUAL CAMERA SYSTEM

An ASA Voyager rear vision camera system model # OBS713PKG shall be provided to allow the driver to visually see the rear of the apparatus while in the cab. The system shall include an ASA model # AOM713WP flat panel LCD color monitor mounted adjacent to the driver and a ASA model # VCCS150 color camera that shall be mounted at the rear of the vehicle.

In addition to the rear vision camera, a ASA model# VCCSIDR-CM side mounted camera shall be mounted on the officer side of the cab.

The cameras shall be wired as follows:

- The side vision camera shall automatically activate when the officer side turn signal is activated.
- The rear vision camera shall automatically activate when the chassis transmission is placed in reverse.



The monitor for the rear vision system shall be mounted ceiling of the cab in easy view of the driver.

HEADLIGHTS CLUSTER

Two (2) quad, halogen headlight modules with a bright finish bezel shall be furnished, one (1) each side, on the front of the cab. Each head light module shall incorporate an individual low beam and a high beam headlight. High beam actuation shall be controlled on the turn signal lever.

DAYTIME RUNNING LIGHTS

The chassis head lights shall have integrated circuitry to actuate the low beam headlights at a maximum of 80 percent of capacity whenever the chassis engine is running.

The daytime running lights shall be interlocked with the parking brake.

SECONDARY DUAL LIGHT MODULE

Two (2) Whelen 60A00TAR arrow shaped, amber LED turn signals shall be provided, one (1) in each side of the dual light module above the headlights.

The NFPA required, Zone "A" lower warning lights shall be incorporated into each side dual light module noted above.

DOT MARKER LIGHTS AND REFLECTORS

DOT MARKER LIGHTS AND REFLECTORS

Five (5) DOT approved Weldon (or equal) model # 9186-1500-20 Light Emitting Diode (LED) cab marker lamps shall be mounted on the front upper edge of the cab, above the windshield.

Amber LED marker lights with integral reflectors shall be provided on the side of the cab adjacent to the driver's door, one (1) each side.

Truck-Lite Model # 18 red LED marker lights with integral reflectors shall be provided at the lower side rear, one (1) each side.

Truck-Lite # 60115Y yellow LED side marker and turn lights shall be provided on the apparatus lower side, forward of rear axle, one (1) each side.

Truck-Lite Model #19 red LED clearance lights shall be provided on the apparatus rear upper, one (1) each side at the outermost practical location.

Truck-Lite Model # 33740R LED 3-lamp identification bar will be provided on the apparatus rear center. The lights shall be red in color.

Truck-Lite # 98034Y yellow reflectors shall be provided on the apparatus body lower side, as far forward and low as practical, one (1) each side if the apparatus is 30' long or longer.

Truck-Lite # 98034R red reflectors shall be provided on the apparatus rear, one (1) each side at the outermost practical location.

LICENSE PLATE LIGHT - REAR

One (1) Weldon model # 9186 license plate light shall be provided above the mounting position of the license plate. The light shall be clear and shall have a chrome finish.

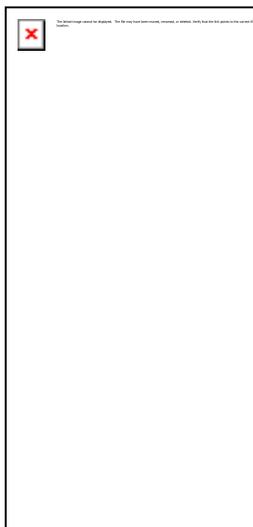
TAIL, STOP, TURN AND BACK-UP LIGHTS

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED red combination tail and stop lights, shall be mounted one each side at the rear of the body.

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED amber arrow turn signal lights, shall be mounted one each side, on a vertical plane with the tail/stop lights.

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED white back-up lights, shall be mounted, one each side on a vertical plane with the turn/tail/stop signals. These lights shall activate when the transmission is placed in reverse gear.

Two (2) Whelen M6FCV4 mounting flanges, installed one (1) on each side, shall be provided to mount the lights described above in one common mounting flange. The fourth opening shall be for the lower rear warning lights.



LED THIRD BRAKE LIGHT

One (1) Whelen # M6 series, 4" x 6" size, red LED stop light shall be mounted centered on the rear of the body as high as practical. The light shall be mounted with a chrome flange.

CAB STEP LIGHTS

Chrome plated Whelen model # T0C0ACCR; 2" diameter, LED chassis step lights shall be provided and controlled with marker light actuation. The lights shall be surface mounted using Whelen # TFLANGEC, chrome plated flange. Step lights shall be located to properly illuminate all chassis access steps and walkway areas.

BODY STEP LIGHTS

Chrome plated Whelen model # 0AC0EDCR, shielded LED body step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all body access steps and walkway areas.

DUNNAGE AREA LIGHTING

Two (2) chrome plated Weldon model # 9186, shielded halogen lights shall be provided in the dunnage area to provide adequate illumination of this area.

SCENE LIGHTS - REAR OF BODY

Two (2) Whelen 810 series Opti-Scene halogen scene lights, with internal optics, shall be provided, one on each side of the rear body panel. The scene lights shall be controlled by a rocker switch

in the master warning light switch console. All scene lights shall be wired through the load management system.

SCENE LIGHTS - BEHIND FRONT CAB DOORS

Two (2) Whelen M9ZC super LED scene lights shall be provided, one on each side of the cab, directly behind the front cab entrance door in a chrome plated flange. Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be controlled by a rocker switch in the master warning light switch console. All scene lights shall be wired through the load management system.

CAB SCENE LIGHTS - ADDITIONAL ACTIVATION

In addition to the cab mounted switch for the cab scene lights, the driver and officer cab doors shall activate the respective light when a cab door is opened.

REAR SCENE LIGHTS - ADDITIONAL ACTIVATION

In addition to the cab mounted switch for the rear scene lights, the rear scene lights shall illuminate when the transmission is placed in reverse gear and the apparatus is operating as an emergency vehicle (Primary Warning switch on).

SCENE LTS, BODY SIDE FRONT

sCENE LTS bODY SIDE REAR

GROUND LIGHTS - CAB

One (1) Amdor Luma Bar H2O LED 20" ground light shall be provided under each side cab door entrance step, four (4) total. The ground lights shall turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

Each light shall illuminate an area at a minimum 30" outward from the edge of the vehicle.



ROOF MOUNT 215W LED BROW LIGHT - ABOVE WINDSHIELD

Two (2) Fire Research Spectra LED Scene Light model SPA830-Q20 roof mount lights shall be installed. The lower mounting bracket shall allow the bottom of the lamp head to pivot and the upper mounting bracket shall extend out on a turnbuckle that is adjustable to set the lamp head angle. Wiring shall extend from a weatherproof strain relief at the rear of the lamp head.

Each lamp head shall have eighty four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern and shall operate at 12 volts DC, draw 18 amps, and generate 20,000 lumens of light. Each lamp head shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamp head angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob.

The Spectra brow mounted flood light shall be located one (1) each side above the windshield.

ROOF MOUNT 215W LED BROW LIGHT - ABOVE WINDSHIELD

Two (2) Fire Research Spectra LED Scene Light model SPA830-Q20 roof mount lights shall be installed. The lower mounting bracket shall allow the bottom of the lamp head to pivot and the upper mounting bracket shall extend out on a turnbuckle that is adjustable to set the lamp head angle. Wiring shall extend from a weatherproof strain relief at the rear of the lamp head.

Each lamp head shall have eighty four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern and shall operate at 12 volts DC, draw 18 amps, and generate 20,000 lumens of light. Each lamp head shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamp head angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob.

The Spectra brow mounted flood light shall be located one (1) each side of the cab above the forward cab doors.

LIGHTS ABOVE WINDSHIELD MASTER POWER SWITCH

A master power switch shall be provided in the cab warning light switch console to turn the lights above windshield on and off.

LIGHTS AT FRONT DOOR RADIUS MASTER POWER SWITCH

A master power switch shall be provided in the cab warning light switch console to turn the lights at the front door radius on and off.

****** BODY ELECTRICAL SYSTEM ******

12 VOLT BODY ELECTRICAL SYSTEM

All electrical lines in the body shall be protected by automatic circuit breakers, conveniently located to permit ease of service. Flashers, heavy solenoids and other major electrical controls shall be located in a central area near the circuit breakers.

All lines shall be color and function coded every 3", easy to identify, oversized for the intended loads and installed in accordance with a detailed diagram. A complete wiring diagram shall be supplied with the apparatus.

Wiring shall be carefully protected from weather elements and snagging. Heavy duty loom shall be used for the entire length. Grommets shall be utilized where wiring passes through panels.

In order to minimize the risk of heat damage, wires run in the engine compartment area shall be carefully installed and suitably protected by the installation of heat resistant shielded loom.

All electrical equipment shall be installed to conform to the latest federal standards as outlined in NFPA 1901.

BODY ELECTRICAL JUNCTION COMPARTMENT

A weather resistant electric junction compartment shall be provided in the left or right side lower front compartment. This compartment shall be recessed through the inside rear wall of the compartment to provide an easily accessible enclosure to house all of the body wiring junction points, terminal strips, solenoids, etc. The design of this compartment shall not decrease the storage capacity area of the compartment in which it is located. A removable panel shall be provided for access to this compartment.

PUMP ENCLOSURE WORK LIGHTS

Two (2) Peterson model #M391 lights shall be provided inside the pump enclosure providing a minimum of 20 candlepower illumination. Each light shall have their own independent switch incorporated into the light head.

ENGINE COMPARTMENT WORK LIGHTS

Two (2) Peterson model #M391 lights shall be provided inside the engine enclosure that will provide a minimum of 20 candlepower illumination. Each light shall have their own independent switch incorporated into the light head.

AMDOR LUMA BAR TRACK MOUNTED COMPARTMENT LIGHTS - LED

Each individual, equipment storage compartment shall be equipped with the AMDOR Luma Bar LED light fixture mounted one each side of the forward (and rear) vertical door frame.



DRIVER SIDE ROOF COMPARTMENT LIGHTING

One (1) Weldon #9186 halogen compartment light(s) shall be provided, to ensure proper compartment illumination. The lights shall be mounted to the roof compartment doors and shall be activated with a magnetic door switch that shall be connected to the door ajar warning circuit.

OFFICER SIDE ROOF COMPARTMENT LIGHTING

One (1) Weldon #9186 halogen compartment light(s) shall be provided, to ensure proper compartment illumination. The lights shall be mounted to the roof compartment doors and shall be activated with a magnetic door switch that shall be connected to the door ajar warning circuit.

NFPA AUDIBLE AND LIGHTING WARNING PACKAGE

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard. The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" as noted.

LIGHT PACKAGE ACTUATION CONTROLS

The entire warning light package shall be actuated with a single warning light switch located on the cab switch panel. The wiring for the warning light package shall engage all of the lights required for "Clearing Right of Way" mode when the vehicle parking brake is not engaged. An automatic control system shall be provided to switch the warning lights to the "Blocking Right of Way" mode when the vehicle parking brake is engaged.

UPPER LEVEL LIGHTING - WHELEN

NFPA ZONE A, UPPER

A Whelen # FNQLED "Edge Freedom", 82" cab roof warning lightbar shall be furnished and rigidly mounted on top of the cab roof. The lightbar shall be equipped with the following:

- Two Front Corner Red Linear LED's
- Two Red Forward Facing Linear LED's
- Two White Forward Facing Linear LED's
- Two Red End Linear LED's.

The forward facing clear LED flashers shall be disabled automatically for the "Blocking Right of Way" mode.

The Freedom light bar shall be equipped with a # 795H Low Profile LED Opticom emitter. The Opticom emitter shall be disabled automatically for the "Blocking Right of Way" mode.

The Freedom light bar shall be equipped with one (1) pair(s) of # FLDRR red LED warning lights.

NFPA ZONE C, UPPER

Two (2) surface mounted Whelen M9R super LED light heads shall be furnished and mounted one (1) each side on the upper rear face of the body, facing rear. Each upper rear LED flashing light head shall be equipped with a red lens and chrome plated flange.

NFPA ZONES B & D REAR, UPPER

Two (2) surface mounted Whelen M9R super LED light heads shall be furnished and mounted one (1) each side on the upper side face, towards the rear of the body, facing to each side of the unit. Each upper rear LED light head shall be equipped with a red lens and chrome plated flange.

NFPA ZONES B & D FRONT, UPPER

Two (2) surface mounted Whelen M9R, super LED light heads shall be furnished and mounted one (1) each side on the upper side face, towards the front of the body, facing to each side of the unit. Each upper front LED light head shall be equipped with a red lens and chrome plated flange.

LOWER LEVEL LIGHTING - WHELEN

NFPA ZONE A, LOWER

Two (2) Whelen # M6R super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

The lower Zone A warning lights shall be mounted in the custom chassis headlight bezels.

NFPA ZONE C, LOWER

Two (2) Whelen #M6R super LED light heads shall be provided and installed; one (1) each side directly below the DOT stop, tail, turn and backup lights. Each light shall be equipped with a red lens and chrome plated mounting flange.

NFPA ZONES B & D FRONT, LOWER

Two (2) Whelen # M6R super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

The lower Zone B & D warning lights shall be mounted on the sides of the custom chassis front bumper.

NFPA ZONES B & D MIDSHIP, LOWER

Two (2) Whelen # M6R super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

NFPA ZONES B & D REAR, LOWER

Two (2) Whelen # M6R super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

WARNING LIGHT SYSTEM CERTIFICATION

The warning light system(s) specified above shall not exceed a combined total amperage draw of 45 AMPS with all lights activated in either the "Clearing Right of Way" or the "Blocking Right of Way" mode.

The warning light system(s) shall be certified by the light system manufacturer(s), to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the General Requirements section of these specifications. The NFPA required "Certificate of Compliance" shall be provided with the completed apparatus.

ALTERNATING FLASHING HEADLIGHT SYSTEM

An alternating flashing wig-wag system, wired to the apparatus headlights, shall be installed. The wig-wag system shall be individually switched at the master light console. The alternating flashing system shall be automatically disabled during the "Blocking Right of Way" mode.

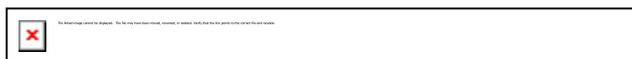
ROOF MOUNTED LIGHT BARS

A pair of Whelen model FNMINI, 24" Freedom, cab roof warning light bars shall be furnished and rigidly mounted, one (1) at each side on the cab roof facing to each side of the unit. Each light bar shall be equipped with two (2) red corner LED's, one (1) forward facing LED and one (1) side facing LED. All the lenses shall be clear.

The lights specified above shall be provided in addition to the NFPA required Optical Warning Light Package and shall be switched independently from the light package. Additionally, wiring for the independently switched lights specified, shall be run through the Load Management System to ensure that the electrical system is not overloaded by the additional amperage draw requirements.

TRAFFIC ADVISER WARNING LIGHT

One (1) Whelen LED "Traffic Advisor", model TAL85 48", rear directional light shall be installed on the rear of the body. The light shall be equipped with eight (8) lamps. The directional light shall be activated by a control module. The control module shall be conveniently located near the driver's position. The rear directional light shall be wired through the load management system of the unit.



ELECTRIC HORN

A single electric horn activated by the steering wheel horn button shall be furnished.

BACK-UP ALARM

A Code 3, model # D450C, 87dBA back-up alarm, shall be provided and installed at the rear of the apparatus under the tailboard. The back-up alarm shall activate automatically when the transmission is placed in reverse gear and the ignition is "on".

AIR HORNS

Two (2) chrome plated air horns shall be at the front of the vehicle. The air horns shall be mounted in full compliance with NFPA-1901. The supply lines shall be dual 1/4" lines with equal distance from each horn.

Each air horn shall be recessed in the front bumper, one (1) on the driver's side and one (1) on the officer's side.

The air horn(s) shall be controlled by dual ceiling mounted lanyard cables, located in the center of the cab.

ELECTRONIC SIREN

One (1) Federal Model # PA300R, 200 watt flush mounted electronic siren shall be provided featuring: wail, yelp and hi-lo siren tones along with public address, radio rebroadcast and air horn with siren override. A hardwired microphone shall provided for the public address feature.

Two (2) siren controls shall be recessed mounted, one (1) on each side of the cab dash with the PA control recessed mounted towards the officer side of the cab dash.

The electronic siren and speakers shall meet the NFPA required SAE certification to ensure compatibility between the siren and speaker.



Two (2) Federal, model # ES100 siren speakers shall be provided, recessed in the front bumper and wired to the electronic siren.

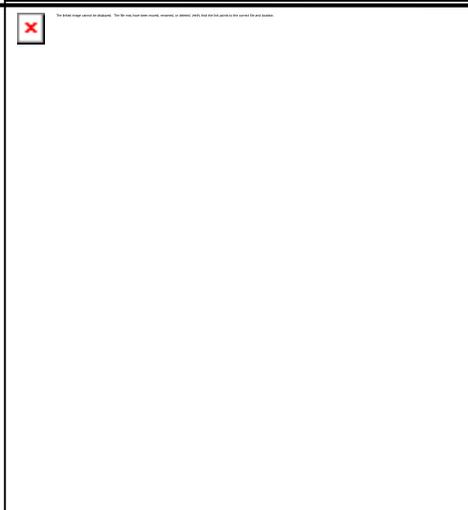


FEDERAL Q2B MECHANICAL SIREN

One (1) Federal Model #Q2B mechanical siren shall be provided to provide audible warning.



The Q2-B siren shall be pedestal mounted on top of the extended bumper on the driver's side. The siren shall be equipped with a Federal model #P, chrome housing and pedestal.



A floor mounted foot switch shall be provided for the officer. A siren brake button shall be provided near the driver's position.

A rocker switch shall be installed in the dash panel to allow control of either the air horn or the siren from the steering wheel horn button for the driver.

A second push button siren brake switch shall be provided on the cab dash near the officers seating position.

FIRECOM MODEL #3010R INTERCOM SYSTEM

A Firecom model # 3010R intercom system shall be provided in the front of the cab. The system shall be capable of interfacing with a two-way radio system (note: an authorized two-way radio installer shall be responsible for interfacing the intercom system with the two-way radio). The master station shall be capable of accepting up to six positions (plus exterior positions), and utilize a 12 volt nominal power supply. The unit shall have a touch pad adjustable volume control and have advanced noise reducing circuitry.

The intercom system shall include:

DRIVERS AND OFFICERS HEADSETS & BASE STATION FOR WIRELESS FIRECOM SYSTEM

Two (2) UHW-51 wireless under helmet radio transmit headsets, each with their own paired base station, shall be furnished for the driver and officer seating locations in the cab. The headsets shall have adjustable volume, noise-canceling electric microphone, adjustable head strap, a flex-style boom which rotates for left or right dress and a charging port to connect the 12 volt charger when the headset is not in use. The sets shall also have comfortable ComLeather ear seals.

Two (2) wireless, single user, base stations shall be connected via a 6 conductor flat RJ-6 cable to any headset port on the Firecom 3010 series intercom. The base station will provide full duplex audio communication between the wireless headset and the intercom as well as PTT communication through the apparatus mobile radio.



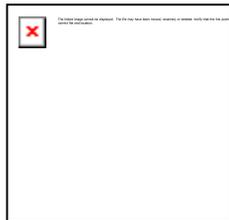
Two (2) yellow, NFPA compliant, rubber coated steel headset hanger hooks shall be furnished in the front section of the cab to hold the driver and offer intercom headsets while not in use.

RADIO INTERFACE CABLE

One (1) radio interface cable, model # 110-5101-30 and one (1) extension cable model # 108-0086-00 shall be provided and installed from the firecom base unit to the area of where the mobile radio base station shall be mounted. The end of the cable that connects to the mobile radio shall be un-terminated and shall be the responsibility of the radio installer to provide and install the correct adapter to connect the cable to the mobile radio.

REAR JUMPSEAT HEADSETS

Two (2) UH-52 single-plug under helmet intercom headsets shall be furnished for two (2) rear jump seat locations. The intercom headsets shall have adjustable volume, noise-canceling electric microphone, adjustable head strap, and a flex-style boom which rotates for left or right dress. The sets shall also have comfortable ComLeather ear seals.



Two (2) HM-10 plug in modules shall be furnished in the rear crew area of the cab at the jump seat locations to accommodate the intercom headsets.

Two (2) yellow, NFPA compliant, rubber coated steel headset hanger hooks shall be furnished to hold the intercom headsets while not in use.

WEATHER BAND AM/FM/CD RADIO

A Weather Band/AM/FM, CD, MP3, Satellite ready player with a wireless remote shall be installed in the cab overhead panel as space allows. The speakers shall be located as follows:

- (2) 6 inch mounted in the Front of the cab
- (2) 6 inch mounted in the Rear of the cab

****** PUMP AND PLUMBING ******

PUMP

- **WATEROUS CSU-C20**
- **2000 G.P.M.**
- **SINGLE-STAGE**

The pump shall be of single-stage construction and shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA-1901 and shall have a rated capacity of 2000 gpm.

The pump must deliver the percentage of rated capacity at the pressure listed below:

- 100% of rated capacity at 150 P.S.I. net pump pressure
- 100% of rated capacity at 165 P.S.I. net pump pressure

- 70% of rated capacity at 200 P.S.I. net pump pressure
- 50% of rated capacity at 250 P.S.I. net pump pressure.

The pump shall be free from objectionable pulsation and vibration under all normal operating conditions.

PUMP CONSTRUCTION

The pump body shall be close-grained gray iron and must be horizontally split in two sections for easy removal of the impeller shaft assembly, and designed for complete servicing from the bottom of the truck without disturbing setting of the pump in the chassis or apparatus piping which is connected to the pump. Pump body halves shall be bolted together on a single horizontal face to minimize chance of leakage and facilitate reassemble.

Discharge manifold shall be cast as an integral part of the pump body assembly and shall provide at least three full 3-1/2 inch openings for ultimate flexibility in providing various discharge outlets for maximum efficiency, and shall be located as follows: one outlet on the right side of the pump body, one outlet on the left side of the pump body, and one outlet on top of the pump discharge manifold.

IMPELLER SHAFT

The Impeller shaft shall be heat-treated stainless steel, ground at all critical areas, and polished under the packing. An exclusive two-piece impeller shaft shall allow separation of the transmission from the pump without disassembling either component. This simplifies repair procedures, resulting in less down time.

BEARINGS

Three deep-groove, anti-friction ball bearings shall be located outside the pumping chamber, which shall give support and proper alignment to the impeller shaft assembly. The bearings shall be oil or grease lubricated, completely separated from the water being pumped, and shall be protected by seal housings, flinger rings and oil seals.

PUMP PACKING

Stuffing boxes shall be equipped with two-piece glands to permit adjustment or replacement of packing without disturbing the pump. Lantern rings shall be located at the inner end of the stuffing boxes the all ring can be removed without removal of the lantern rings. Water shall be fed into the stuffing box lantern rings for proper lubrication and cooling when the pump is operating.

PUMP IMPELLER

The impeller shall be bronze, accurately balanced (mechanically and hydraulically), of mixed flow design with reverse flow labyrinth-type wear rings that resist water bypass and loss of efficiency due to wear.

Wear rings shall be bronze, and shall be easily replaceable to restore original pump efficiency and eliminate the need for replacing the entire pump casing due to wear.

PUMP TRANSMISSION

The pump transmission shall be all aluminum "C20" model, rigidly attached to the pump body assembly and be of latest design incorporating a high strength involute tooth-form Hy-Vo chain drive. The driven sprockets shall be capable of operating at high speeds to provide smooth, quiet transfer of power.

The shift engagement shall be accomplished by a free-sliding collar and shall incorporate an internal locking mechanism to insure that the collar shall be maintained in ROAD or PUMP position.

PUMP RATIO

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

The manufacturer shall supply at time of delivery copies of the pump manufacturer's certification of hydrostatic testing, the engine manufacturer's current certified brake horsepower curve.

PUMP SHIFT

The pump shift shall be pneumatically operated and shall incorporate a standard automotive air valve shifting mechanism for ease of maintenance and parts availability. The pump shift valve shall be mounted in the cab and identified as PUMP SHIFT, and include shift instructions permanently inscribed on the pump shift switch plate. The in cab control valve shall include a detent lock to prevent accidental shifting.

EMERGENCY PUMP SHIFT

An emergency manual pump shift control shall be furnished on the left side pump panel which may be utilized if the air shift control does not operate.

A transmission, manual lock-up switch shall be furnished in the cab to ensure positive lock-up of the transmission.

PUMP SHIFT INDICATORS LIGHT

The pump shift assembly shall incorporate an indicating light system which shall warn the operator if the shift to PUMP has not been completed and indicate when it has been completed. The switch that activates the lights must be mounted on the pump transmission and positioned so that the pump shift arm activates the switch only when the shift arm has completed its full travel into PUMP position.

TRANSMISSION LOCK

The automatic transmission furnished in the chassis shall have a lock-up assembly which brings the transmission to direct drive and prevents the transmission from shifting gears while in the pumping mode.

BRAKING SYSTEM

A positive braking system shall be provided to prevent vehicle movement during pumping operations. The air brakes furnished must satisfy this requirement.

MAIN PUMP MOUNTS

Extra heavy duty pump mounting brackets shall be furnished. These shall be bolted to the frame rails in such a position to perfectly align the pump so that the angular velocity of the drive line joints shall be the same on each end of the drive shaft. This shall assure full capacity performance with a minimum of vibration. Mounting hardware shall utilize Grade 8 bolts.

Pumps which are not mounted directly to the frame will not be considered. Under no circumstance shall the pump function as a frame cross member.

***** PRESSURE CONTROL & ACCESSORIES *****

PRESSURE RELIEF VALVE

A Waterous relief valve system shall be positive and quick acting, and shall have a control valve to provide instantaneous hydraulic lock-out which does not require the operator to cancel out or disturb the pressure setting. Relief valve control (pilot valve) shall be protected from malfunction due to sand or other sediment in the water by a strainer which can be removed, cleaned and replaced from the operator's panel while the pump is operating. Relief valve indicator lights shall be provided and mounted on the panel adjacent to the pilot valve assembly. The indicator lights are to be "amber" and marked OPEN to indicate the relief valve is bypassing and "green" marked CLOSED to indicate when the relief valve is closed.

INTAKE RELIEF VALVE

An A1860 Series relief valve shall be provided. The valve shall be adjustable from 50 to 200 psi (3 to 14 bar) with easy to see 25 psi (2 bar) increments. The aluminum casting shall be hardcoat anodized, and powder coat finished inside and out for maximum corrosion protection. Works with Darley, Waterous, or Hale bolt hole patterns for direct use on pump flanges. Also available with 2-inch male pipe thread, 2.5-inch male NH thread, or 2.5-inch Victaulic® connection on discharge.

PUMP CERTIFICATION

The pump shall be third party performance tested to meet the requirements of NFPA-1901. To ensure top quality and integrity, the test company shall be Underwriters Laboratories (UL).

PRIMING PUMP

The priming pump shall be a 12-volt Waterous model VPO Oil-Less, positive displacement vane type, electrically driven. One priming control shall open the priming valve and start the priming motor. The primer shall be capable of priming without the use of primer oil. The primer shall be connected to the power source with a 300 amp fusible link.

The primer shall be activated by a mechanical/electrical valve with a single push/pull rod control located on the pump operator's panel. Valve actuation may be accomplished while the main pump is operational, if necessary to assure complete prime.

An additional primer control valve shall be furnished, piped directly to the front/ rear suction line piping. The priming valve shall activate the standard pump primer to minimize pump cavitation during remote suction operations and shall be located on the pump operator's panel.

MASTER DRAIN

The Waterous manifold drain assembly shall consist of a stainless steel plunger in a bronze body with multiple ports. The valve shall be designed so that pump discharge pressure prevents it from opening accidentally. The drain valve control shall be panel mounted, cable or rod operated and identified PUMP DRAIN.

INDIVIDUAL BLEEDERS AND DRAINS

All lines shall drain through the master drain valve or shall be equipped with individual drain valves, easily accessible and labeled.

One (1) individual "Innovative Control" lift up drain valve shall be furnished for each 1-1/2" or larger discharge port and each 2-1/2" gated auxiliary suction.

Drain/bleeder valves shall be located at the bottom of the side pump module panels.

All drains and bleeders shall discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

Small lines within the pump enclosure shall be constructed from Synflex hose. Uses include, but are not limited to such lines as priming control, gauge lines, drain lines, air control valves, pump shift, supplemental cooling, foam flush and air bleeder valves.

ANODE BLOCKS

Four (4) Waterous zinc anode blocks shall be provided and located two (2) on the suction side and two (2) on the discharge side of the pump to protect the pump from corrosion.

The Anodes shall be painted Safety Yellow for identification purposes.

PUMP OVERHEAT INDICATOR SYSTEM

A Waterous Overheat Protection Manager (OPM) shall be provided to serve as a safety device by releasing hot water from the discharge area of the pump to the ground or back to a water tank. The OPM consists of a valve that opens when the water in the pump reaches 140 F (60 C) and a warning light that is triggered by a thermal switch when the water in the pump reaches 180 F (82 C). The warning light acts as an additional protection device if the temperature inside the pump keeps rising although the valve is open. The OPM valve and switch are both mounted on two 1/2" tapped holes located near the center discharge area of the pump.

TOP MOUNT PUMP MODULE

The pump module shall be a self-supported structure mounted independently from the body and chassis cab. The design must allow normal frame deflection without imposing stress on the pump module structure or side running boards. The pump module shall be securely mounted to the chassis frame rails.

The pump module shall incorporate a formed structure on the top front to support the top mount control panel and required mechanical control handles.

TOP MOUNTED VALVE CONTROLS

The valves shall be controlled by vertically operated swing handles. Each handle shall be equipped with a twist-lock, easy-grip knob. The valve control handles shall be mounted in-line. Each valve control handle shall be connected to its respective valve via a control rod and a bell crank mechanism, if needed. Each control rod shall consist of a 1/2" pipe welded to a threaded stud to form a rigid linkage. Each pressure gauge shall be located directly above its respective discharge control handle, and shall be clearly marked by color coded name plates.

The pump module shall be a welded frame work utilizing structural steel components properly braced to withstand the rigors of chassis frame flex.

DUNNAGE AREA

A dunnage area shall be provided above the pump enclosure, behind the top mount control panel, for equipment mounting and storage. This area shall be furnished with a removable 3/16" aluminum tread plate floor and shall be enclosed on the sides.

NOTE: The size of this storage area may vary when top mounted crosslays, booster reel(s), etc., are specified and located in this area.

TRANSVERSE WALKWAY

There shall be a transverse walkway located at the rear of the chassis cab, ahead of the pump module. The walkway shall be constructed of 3/16" aluminum tread plate and shall be clear and unobstructed for through traffic.

A miscellaneous equipment storage compartment shall be provided at either side of the walkway, outboard of the chassis frame rails. A vertically hinged, aluminum tread plate door with positive closure latch shall be provided on the outboard face of each compartment. Compartments shall be ventilated.

******* PUMP SUCTIONS & AUXILIARY INLETS *******

SUCTION INLETS

Two (2) 6" N.S.T. suction inlets shall be provided, one on the driver side pump panel and one on the officer side pump panel. A removable strainer shall be installed on each inlet.

PUMP SUCTION ENDS

The main pump suction inlets shall be furnished with a short suction end, terminating with only the suction threads protruding through the side panel to minimize the distance an exterior appliance protrudes beyond the pump panel.

A 6" NST chrome plated long handle pressure vented cap shall be installed on each main inlet of the pump.

One (1) 6" NH x 5" Storz TFT Ball Intake Valve AB1ST-NX 30° degree adapter and 5" storz cap shall be provided for the driver side main suction inlet.

One (1) 6" NH x 5" Storz TFT Ball Intake Valve AB1ST-NX 30° degree adapter and 5" storz cap shall be provided for the officer side main suction inlet.

FRONT SUCTION

A 6" N.S.T. front suction inlet shall be provided at the front of the vehicle, plumbed from the pump.

The front inlet shall be located above the right hand side of the front bumper extension and shall terminate with a chromed brass, chicksan style swivel to allow a minimum of 180 degree rotation of the inlet for suction hose attachment.

The front suction pipe shall be equipped with a chrome 6" NSTM thread adapter.

The front inlet shall be plumbed utilizing 5", schedule 10 stainless steel piping, 45 degree weld elbows and a limited number of 90 degree sweep elbows in a welded assembly from the pump to the front of the cab.

A minimum of two (2) grooved pipe couplings shall be furnished in this assembly to allow for flex and serviceability.

The front suction plumbing shall be fitted with a Waterous "Monarch" valve, on the front suction inlet. The valve shall be in the pump enclosure area with a manual override located directly on the valve actuator. The valve body and all related components that are in contact with water shall be manufactured of fine grained, corrosion resistant bronze.

The valve shall be electrically operated by a toggle switch control, mounted on the operator's panel. The electric control shall incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position.

The valve housing shall incorporate a pressure relief valve, set at the pump manufacturer's facility to a rating of 125 PSI. The pressure relief valve shall provide protection for the suction hose even with the valve in the closed position. The valve shall incorporate an NFPA compliant, large diameter hose air bleed valve, controlled at the operator's panel.

One (1) 6" NST chrome plated long handle vented cap(s) shall be installed on front suction.

AUXILIARY SIDE SUCTION(S)

One (1) 2-1/2" auxiliary suction shall be provided at the driver side pump panel, to the front of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side front auxiliary suction. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

A 1/4 turn swing control handle shall be provided on the driver side front auxiliary suction valve.

One (1) 2-1/2" auxiliary suction shall be provided at the officer side pump panel, to the front of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side front auxiliary suction. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

A 1/4 turn swing control handle shall be provided on the officer side front auxiliary suction valve.

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels.
(No Exceptions)

TANK TO PUMP

One (1) 3" tank to pump line shall be, piped through the front bulkhead of the tank with a 90 degree elbow down into the tank sump. This line shall be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

A check valve shall be provided to prevent accidental pressurization of the water tank through the pump connection. Connection from the valve to the tank shall be made by using a non-collapsible flexible rubber hose.

An Akron Brass 3" Generation II Swing-Out™ Valve shall be provided between the pump suction manifold and the water tank. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

A locking push/pull control handle shall be located on the operator's panel with function plate.

TANK FILL

One (1) 2 1/2" gated full flow pump to tank refill line controlled at the pump panel shall be provided. A deflector shield inside the tank shall be furnished. Tank fill plumbing shall utilize 2 1/2" high pressure hose for tank connection to accommodate flexing between components. (NO EXCEPTIONS)

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided between the pump discharge manifold and the water tank. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

A locking push/pull control handle shall be located on the operator's panel with function plate.

******* DISCHARGES & ACCESSORIES -SIDE MOUNT *******

DRIVER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges # 1 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The discharge valve shall be equipped with integral 2 1/2" NST, 30 degree, chrome plated elbow.

A 2 1/2 " NST chrome plated pressure vented cap shall be installed on driver's side #1 discharge.

The driver's side # 1 discharge valve shall be controlled by a locking push/pull swing handle located on the top mount operator's panel.

The driver's side # 1 discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

DRIVER'S SIDE MAIN DISCHARGE #3

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges #3 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 4" Generation II Swing-Out™ Valve shall be provided for the driver's side #3 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing device. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The discharge valve shall be equipped with integral 4" NST, 30 degree, chrome plated elbow.

A 4" NST chrome plated pressure vented cap shall be installed on driver's side # 3 discharge.

The driver's side # 3 discharge valve shall be equipped with an Akron Brass Style 9313 Valve Controller. The electric controls must be of current limiting design, requiring no clutches in the motor. The unit must have boot switches with momentary open and close as well as an optional one touch full open feature to operate the actuator. The unit must provide position indication through 10 LED light indicators for maximum visibility.

The driver's side # 3 discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

OFFICER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #1 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The discharge valve shall be equipped with integral 2 1/2" NST, 30 degree, chrome plated elbow.

A 2 1/2" NST chrome plated pressure vented cap shall be installed on officer's side # 1 discharge.

The officer's side # 1 discharge valve shall be controlled by a locking push/pull swing handle located on the top mount operator's panel.

The officer's side # 1 discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

OFFICER'S SIDE MAIN DISCHARGE #2

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #2 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 4" Generation II Swing-Out™ Valve shall be provided for the officer's side #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The discharge valve shall be equipped with integral 4" NST, 30 degree, chrome plated elbow.

A 4" NST chrome plated pressure vented cap shall be installed on officer's side #2 discharge.

The officer's side #2 discharge valve shall be equipped with an Akron Brass Style 9313 Valve Controller. The electric controls must be of current limiting design, requiring no clutches in the motor. The unit must have booted switches with momentary open and close as well as an optional one touch full open feature to operate the actuator. The unit must provide position indication through 10 LED light indicators for maximum visibility.

The officer's side #2 discharge shall be equipped with a 2 ½" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

DRIVER SIDE REAR DISCHARGE

A 2 1/2" NST rear discharge shall be provided at the rear of the vehicle, plumbed from the pump.

The rear discharge shall terminate on the rear body panel, on the driver side of the body.

The driver side rear discharge pipe shall be equipped with a chrome 2 1/2" NSTM thread adapter.

The driver side rear discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side rear discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing device. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The driver side rear discharge valve shall be controlled by a push/pull handle located on the operator's panel.

One (1) 2 1/2" NST chrome plated pressure vented cap(s) shall be installed at the driver side rear discharge.

The driver side rear discharge shall be equipped with a 2 ½" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be

filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

OFFICER SIDE REAR DISCHARGE

A 2 1/2" NST rear discharge shall be provided at the rear of the vehicle, plumbed from the pump.

The rear discharge shall terminate on the rear body panel, on the officer side of the body.

The officer side rear discharge pipe shall be equipped with a chrome 2 1/2" NSTM thread adapter.

The officer side rear discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side rear discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The officer side rear discharge valve shall be controlled by a push/pull handle located on the operator's panel.

One (1) 2 1/2" NST chrome plated pressure vented cap shall be installed at the officer side rear discharge.

The officer side rear discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

DECK GUN DISCHARGE

A deck gun discharge shall be plumbed from the pump to an area on top of the vehicle. The deck gun piping shall be firmly supported and braced.

The deck gun discharge shall be located in the center of the dunnage area above the pump module, centered on the pump operator's panel. The piping shall be positioned so the deck gun appliance is accessible from the pump operator's position.

A pedestal type, 1/4" steel plate support assembly or "U" clamp shall be provided to stabilize deck gun plumbing below deck gun mount flange.

The deck gun discharge pipe shall terminate with 3" NPT threads.

The deck gun piping shall be designed so the overall height of the deck gun in the mounted/stowed position does not exceed the tallest point on the cab/body.

The deck gun discharge shall be plumbed utilizing 3" schedule 10 stainless steel piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the deck gun location.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 3" Generation II Swing-Out™ Valve shall be provided for the deck gun discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing device. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The deck gun discharge valve shall be controlled by a push/pull handle located on the operator's panel.

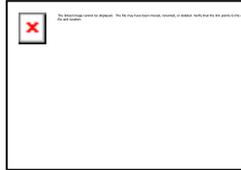
The deck gun discharge shall be equipped with a 2 ½" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

TFT MANUAL DECK GUN

A TFT model #XFC-52 deck gun package which shall include the Safe-Tak ground base with dual 2-1/2" inlets, the Cross Fire monitor top, one (1) set of quad stack tips, one (1) Master Stream 1000 g.p.m. automatic nozzle, stream straightener and a ground base compartment mounting bracket.



FRONT DISCHARGE

A 2 1/2" front #1 discharge shall be plumbed to the front bumper of the vehicle.

The front #1 discharge shall terminate on the top center of the front bumper extension gravel shield with a chrome 2 1/2" NSTM chicksan swivel adapter.

The front #1 discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability. Automatic discharge drains shall be provided at all low points in the plumbing.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the front #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The front #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

A 2 1/2" NST chrome plated pressure vented cap shall be installed the front #1 discharge.

The front #1 discharge shall be equipped with a 2 ½" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

HORIZONTAL CROSSLAY #1

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose.

Crosslay #1 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 2 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #1 discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the crosslay #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The crosslay #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #1 discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

HORIZONTAL CROSSLAY #2

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA-1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose.

Crosslay #2 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 2 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #2 discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the crosslay #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The crosslay #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #2 discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

HORIZONTAL SPEEDLAY #1

Speedlay #1 shall be a transverse hose bed, which shall be designed as an integral part of the pump module design, located forward of the pump just above the frame rails. Hose deployment shall be accomplished from either side of the apparatus. The speedlay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

SPEEDLAY #1 SLIDE-OUT TRAY

A 3/16" aluminum, three (3) sided, "J" shaped slide out tray shall be provided for speedlay #1 to allow easy loading of the hose off the vehicle. The tray shall be designed to slide out from either side of the vehicle. The sides and floor of the opening shall be lined with Nylatron to assist in the loading of the tray.

The tray shall have a cut out on each side of the tray so it may be used as a handle to remove the tray. The handle area shall extend passed the side panel on each end of the tray to allow removal of the tray without getting fingers caught in the latch tray mechanism.

A cadmium plated thumb type latches shall be provided for the tray to secure the tray in the speedlay opening.

The speedlay #1 discharge shall terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter. The hosebed rear wall shall be slotted to allow the swivel to through the wall, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

Speedlay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose. The hose shall be loaded in a double stack configuration.

The speedlay #1 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided for the speedlay #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The speedlay #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The speedlay #1 discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

HORIZONTAL SPEEDLAY #2

Speedlay #2 shall be a transverse hose bed, which shall be designed as an integral part of the pump module design, located forward of the pump just above the lower speedlay. Hose deployment shall be accomplished from either side of the apparatus. The speedlay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

SPEEDLAY #2 SLIDE-OUT TRAY

A 3/16" aluminum, three (3) sided, "J" shaped slide out tray shall be provided for speedlay #2 to allow easy loading of the hose off the vehicle. The tray shall be designed to slide out from either side of the vehicle. The sides and floor of the opening shall be lined with Nylatron to assist in the loading of the tray.

The tray shall have a cut out on each side of the tray so it may be used as a handle to remove the tray. The handle area shall extend passed the side panel on each end of the tray to allow removal of the tray without getting fingers caught in the latch tray mechanism.

A cadmium plated thumb type latches shall be provided for the tray to secure the tray in the speedlay opening.

The speedlay #2 discharge shall terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter. The hosebed rear wall shall be slotted to allow the swivel to through the wall, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

Speedlay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose. The hose shall be loaded in a double stack configuration.

The speedlay #2 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided for the speedlay #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

The speedlay #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The speedlay #2 discharge shall be equipped with a 2 1/2" diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

PUMP ENCLOSURE HOSEBED HOSE RETENTION

A vinyl cross lay cover shall be provided. It shall be securely fastened at the front with snaps and Velcro at the rear, with straps to secure each end flap.

The crosslay cover shall be red in color.

SPEED LAY HOSEBED HOSE RETENTION

Vinyl coated polyester covers shall be provided on each side of the speed lays to retain hose in the speed lays. The covers shall be secured with expandable loops sewn into the covers and hooks on the apparatus.

The speed lay end flap shall be red in color.

****** PUMP PANEL & ACCESSORIES ******

PUMP PANEL - TOP MOUNT

The pump operator's control panel shall be located above the pump towards the rear of the transverse walkway area with the operator facing the rear of the apparatus to operate the pump controls.

The top and side panels shall be completely removable and designed for easy access and servicing.

TOP MOUNT GAUGE PANEL

The top operator's panel shall be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard polished finish.

SIDE PUMP PANEL MATERIAL

The left and right side pump panel shall be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard polished finish.

VERTICALLY HINGED, SPLIT PUMP PANEL DRIVER SIDE

The driver side pump panel shall be split, vertically hinged, to provide complete access to the pump and plumbing on the driver side of the pump enclosure. The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed. The drains located on the driver side panel shall be fastened to the lower panel, which shall be stationary.

VERTICALLY HINGED, SPLIT PUMP PANEL OFFICER SIDE

The officer's side pump panel shall be split, vertically hinged, to provide complete access to the pump and plumbing on the officer side of the pump enclosure. The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed. The drains located on the officer's side panel shall be fastened to the lower panel, which shall be stationary.

PANEL FASTENERS

Stainless steel machine screws and lock washers shall be used to hold these panels in position. The panels shall be easily removable to provide complete access to the pump for major service.

CAPS AND ADAPTERS SAFETY TETHER

All applicable discharge and suction caps, plugs and adapters shall be equipped with chrome plated ball chain or double looped coil chain and secured to the vehicle.

PUMP PANEL TRIM PLATES

A high polish stainless steel trim plate shall be provided around each discharge port and suction inlet opening to allow accessibility to the respective valve for service and repairs.

DISCHARGE GAUGE TRIM BEZELS

Each individual discharge gauge shall be installed into a decorative chrome-plated mounting bezel that incorporates valve-identifying verbiage and color labels.

COLOR CODED IDENTIFICATION TAGS

Color coded identification tags shall be provided for all gauges, controls, connections, switches, inlets and outlets.

PUMP OPERATOR'S PANEL LIGHT SHIELD

The pump operator's panel shall be equipped with a light shield that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare.

The light shield shall be equipped with the following lights:

- Amdor Luma Bar H2O super bright led strip lights.



TOP MOUNT WALKWAY LIGHTING

The top mount walkway shall be illuminated by the following lights:

- Four (4) Whelen #OAC0EDCR 45 degree LED illumination lights.

The lights shall be controlled with the marker lights.

DRIVER SIDE PUMP PANEL

The driver side pump panel shall be equipped with a light shield/step that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare. The light shield shall be fabricated from aluminum tread plate, which shall also serve as a step. The step shall be a minimum of 8" deep X the width of the pump panel.

The light shield shall be equipped with the following lights:

- Amdor Luma Bar H2O super bright led strip lights.

The lights shall be switched with the top mount panel lights.



OFFICER SIDE PUMP PANEL LIGHT SHIELD AND STEP

The officer side pump panel shall be equipped with a light shield/step that shall be full width of the panel, and shall be positioned to cover the lights and prevent glare. The light shield shall be fabricated from aluminum tread plate, which shall also serve as a step. The step shall be a minimum of 8" deep X the width of the pump panel.

The light shield shall be equipped with the following lights:

- Amdor Luma Bar H2O super bright led strip lights.

The lights shall be switched with the operator panel lights.



PUMP OPERATOR'S PANEL

Particular attention is to be given to functional arrangement of all controls. The pump operator's panel shall accommodate the following:

- Hinged gauge panel
- Water tank fill valve
- Auxiliary suction valve control
- All discharge valve controls
- Auxiliary engine cooler controls
- Water tank suction control valve
- Pump primer valve
- Engine throttle control
- Master compound vacuum gauge
- Master pressure gauge
- Individual discharge gauges
- Pump shift engaged indicator light
- Water tank water level indicator
- Engine tachometer
- Engine oil pressure gauge with audible alarm
- Engine water temperature gauge with audible alarm
- Low voltage light and audible alarm
- Pump panel light switch
- Speed counter (Underwriters)

- Pump performance plate (Underwriters)
- Pump serial No. plate
- Master pump drain valve
- Individual drains
- Voltmeter
- Air inlet/outlet at lower driver side panel

- Relief valve with indicator light
- Relief valve drains

- Pump panel air horn actuation button.

- Fire research "ThrottleXcel" throttle control.

- Waterous pressure relief valve control.

PUMP TEST PORTS

The pump panel shall be equipped with Vacuum & Pressure test plugs to allow for test equipment to monitor pump pressure and vacuum levels. Chrome plugs and labels shall be provided for the test ports.

MASTER GAUGES

One (1) 4" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided. The master gauges shall be "No Shok", silicone filled. The gauge faces shall be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES

All applicable pressure gauges shall have a range of 0 - 400 P.S.I., and the compound gauge shall have a range of -30" - 0 - 400 P.S.I.

FIRE RESEARCH "THROTTLEXCEL"

THROTTLE CONTROL AND MONITORING DISPLAY

The apparatus shall be equipped with a Fire Research ThrottleXcel model ELA200-A00 engine throttle and monitoring display shall be installed. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 1/2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The engine RPM shall be set to idle when the pump engaged interlock signal is recognized regardless of the throttle control knob position. Optical technology shall be used to detect the direction and speed that the control knob rotated for RPM control.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display

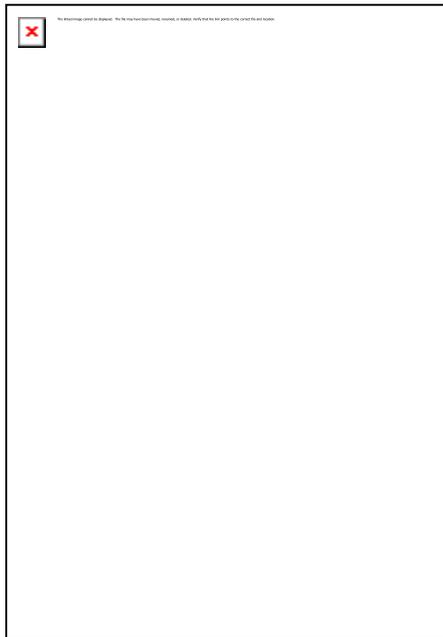
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display
- Interlock; OK TO PUMP LED is green to indicate throttle ready.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. Operator selections and inputs shall be via push buttons on the front panel.

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. The program shall have calibration and self-diagnostic capabilities. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- Low Oil Pressure
- High Engine Coolant Temperature
- High Transmission Temperature
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Battery Voltage
- High Engine RPM.

The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.



ENGINE COOLER

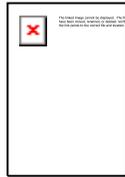
An auxiliary cooler or heat exchanger shall be installed in the engine compartment between the engine and the chassis radiator. The cooler shall permit the use of water from the pump for cooling system. The cooling shall be done without mixing engine and pump water.

TANK LEVEL GAUGE

A Fire Research, model #WLA200-A00, "TANKVISION" gauge that shows the actual volume of water in the tank shall be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright LEDs for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped self-calibration feature allows the LED's TANKVISION gauge to be used on tanks of different shapes and sizes.

Features:

- Flashes warning when the volume is less than 25%. Rapid down scrolling LED's alert the operator when the tank is almost empty. Remote audio warning available.
- One size fits all'. The self-calibration feature allows for easy calibration of any shape or size tank.
- Multiple displays are possible with a single sender through the FRC data bus.
- Rugged waterproof cast aluminum housing.
- No fitting needed for poly tank.
- Special fittings available for other tank materials.
- Connector disconnects at back of display.



The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank.

A Fire Research model #WLA290, remote relay module shall be provided to provide outputs for large indicator lights on the side of the vehicle.

LARGE LIGHT WATER LEVEL GAUGE, EACH SIDE OF CAB

A large light water level gauge system shall be provided on both sides of the cab. Each side shall have a Whelen model PSTANK, LED strip light, surface mounted, behind the rear crew door above the handrail.

The strip light shall indicate the following water levels:

- | | |
|---------------------|-----------|
| • Green LED cluster | Full tank |
| • Blue LED cluster | 3/4 tank |
| • Amber LED cluster | 1/2 tank |
| • Red LED cluster | 1/4 tank |

The red LED's shall burn steady to indicate 1/4 tank and shall start to flash when the water level drops below 1/4 tank. To prevent distraction to drivers, this tank level gauge shall be wired to display only when the park brake is engaged.

WATER TANK

The water tank shall have a capacity of 750 gallons, constructed from Poly material.

TANK CONSTRUCTION

The Poly water tank shall be constructed of PT3 polypropylene material. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from 1/2 to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal technology wherein a

sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3 polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

CAPACITY CERTIFICATION

All tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank shall be weighed empty and full to provide precise fluid capacity. Each Poly-Tank's III is delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight.

TANKNOLOGY TAG

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a OR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

TANK LID

The tank cover shall be constructed of 1/2" thick PT3 polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowers shall accommodate the necessary lifting hardware.

TANK FILL TOWER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3 polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

OVERFLOW AND VENT PIPE

The fill tower shall be fitted with an integral 4" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to a 4" coupling flush mounted into the bottom of the tank to allow water to overflow behind the chassis rear axle.

TANK SUMP

The tank sump shall be a minimum of 10" wide x 10" long x 3" deep. An anti-swirl plate shall be mounted inside the sump, approximately 1" above the bottom of the sump.

A 3" drain plug shall be provided.

OUTLETS

There shall be two (2) standard tank outlets; one for tank-to-pump suction line which shall be a minimum of 4" coupling and one for a tank fill line which shall be a minimum of a 2" N.P.T. coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

WATER TANK MOUNTING

The tank shall rest on the body cross members spaced a maximum of 22" apart, and shall be insulated from these cross members with a minimum of 3/8" nylon webbing or 1/2" rubber, 2-1/2" wide. The tank shall sit cradle-mounted using four (4) corner angles of 6 x 6 x 4 x 0.250 welded directly to the body cross members. The angles shall keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principle and shall not require the use of hold downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure. The body or hose bed cross braces shall act as water tank retainers.

APPARATUS BODY DESIGN CONSTRUCTION

The body side and compartment assemblies shall be designed and assembled to provide maximum strength and durability under all operating conditions.

Special attention shall be taken to minimize corrosion on all fabricated parts and structural members of the body. All bolt-on components shall be provided with a dissimilar metals isolation barrier to prevent electric corrosion. The body design shall also incorporate removable panels to access spring hangers, rear body mounts and fuel tank sending units.

The body assembly shall be an all-welded configuration. The body shall be completely isolated from the cab and pump module structure.

BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM

All compartment panels and body side sheets shall be entirely 3/16" aluminum (5052-H32). Each side compartment assembly shall be both plug welded and stitch welded to ensure proper weld penetration on all panels while avoiding the possible warping caused by a full seam weld. The side compartments shall be welded on a fixture to ensure true body dimensions of all door openings. The side compartments and body side panels are then set into a body squaring fixture where the super structure is installed and the entire body is aligned to be completely symmetrical. The super structure is then welded to the compartment side panels and reinforcement plates are inserted which allows the compartment panels to become an integral component of the body support structure. A full seam weld shall not be used due to the applied heat which shall distort sheet metal and remove the protective coating from the perimeter of the welded area. All seams shall be caulked prior to finish paint to ensure proper compartment seal.

100" WIDE FIRE BODY

The fire body shall be 100" wide to provide the maximum amount of usable hose bed space, approximately 76" wide, and to extend the body fenderettes outward for better tire tread coverage.

SUPER STRUCTURE - ALUMINUM

The body super structure shall be an all welded configuration utilizing a combination of 3" x 1-1/2" 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure shall be designed to totally support the full length and width of the body and shall be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.

The super structure shall be bolted to the sides of the chassis frame at four (4) points.

STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body shall meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be ALCOA No Slip type. Upon request by the Purchaser, the manufacturer shall supply proof of compliance with this requirement.

All vertical surfaces on the body, which incorporate aluminum tread plate material, will utilize the same material pattern to provide a consistent overall appearance.

DRIVER'S SIDE COMPARTMENTATION

One (1) full height compartment shall be provided forward of the rear wheels, measuring 66" high x 49" wide with a single roll-up door opening 62" high x 46" wide.

One (1) full height compartment shall be provided to the rear of the rear wheels, measuring 66" high x 55" wide with a single roll-up door opening 62" high x 52" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring 34" high x 59" wide with a single roll-up door opening 30" high x 53" wide.

The driver's side body compartments shall be 26" deep for the full height of the compartments.

OFFICER'S SIDE COMPARTMENTATION

One (1) full height compartment shall be provided forward of the rear wheels, measuring 66" high x 49" wide with a single roll-up door opening 62" high x 46" wide.

One (1) full height compartment shall be provided to the rear of the rear wheels, measuring 66" high x 55" wide with a single roll-up door opening 62" high x 52" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring 34" high x 59" wide with a single roll-up door opening 30" high x 53" wide.

The officer's side body compartments shall be 26" deep in the lower full depth section and 12" deep in the upper section.

BODY ROOF COMPARTMENTS (DRIVER'S SIDE)

Roof hatch style compartments shall be provided the full length of the body, on the driver's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 25-1/2" inside width with a 22" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" aluminum tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Each compartment shall be equipped with a floor drain with a plastic tube to direct the water below the body.

Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

BODY ROOF COMPARTMENTS (OFFICER'S SIDE)

Roof hatch style compartments shall be provided the full length of the body, on the officer's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 25-1/2" inside width with a 22" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" aluminum tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Each compartment shall be equipped with a plastic tube to direct the water below the body.

Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

KNOX BOX INSTALLATION

KME will mount a customer supplied Knox Box in the officer side of the front of the cab as directed by the department.

INSTALLATION OF CUSTOMER SUPPLIED MEDVAULT

KME will mount a customer supplied Medvault in the lower section of the rear EMS compartment directly behind the officer.

ROLL-UP DOORS

Roll-up doors shall be provided on all compartments. The roll-up doors shall be constructed from aluminum extruded slats which shall have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal shall be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

The door shall be equipped with a lift bar style latch mechanism which shall latch at the bottom of the door mounting extrusion.

The roll-up door assembly shall be furnished with a spring-loaded, counter balance assembly to assist in door actuation.

All running board and high side compartments shall be equipped with roll-up doors.

AMDOR ROLL-DOORS

The roll-up doors shall be Amdor brand roll-up doors. The doors and tracks shall be painted to match the required color of the fire department.

A total of one (1) painted doors shall be provided.

PROTECTION PANEL(S)

One (1) protection panel(s) shall be provided at the top of all body exterior compartments fitted with roll-up doors. The panel(s) shall be installed below the roll-up area to prevent possible damage to the roll-up door by misplaced equipment. Each protection panel shall be bolted in place and have a brushed plain aluminum finish.

SWEEP-OUT COMPARTMENT FLOORS

Compartment floors shall be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors shall have the door opening flanges bend down to produce the sweep-out design.

Compartments with roll-up style doors shall have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor. The sweep out design shall also permit easy cleaning.

A 90° angle door sill protector, fabricated from 18 gauge brushed finish stainless steel shall be installed on the bottom external edge of each body compartment door opening to help protect this area from paint chipping.

COMPARTMENT TOPS

Compartment tops shall be covered with polished aluminum tread plate on both sides.

COMPARTMENT DRIP MOLDING

Compartment tops over all side compartments shall have a 45 degree flange formed out to provide protection against water runoff. A secondary extruded drip molding shall be provided between low compartments and auxiliary high side compartments, when auxiliary compartments are provided.

COATED FASTENERS

All exterior fasteners shall be coated stainless steel screws. Screw threads shall be coated with reusable, self-locking, sealing material to provide vibration resistance. Screw heads shall be coated with a sealing element to prevent galvanic corrosion between dissimilar metals. Non-coated screws shall only be provided as part of vendor supplied component installations.

COMPARTMENT LOUVERS

Ventilation between compartments to atmosphere shall be provided and located to avoid water entry into compartments.

ACCESS PANELS

Removable access panels shall be provided in all lower compartments to access spring pins, fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels shall be located in the rear compartments providing access to the lights and associated wiring. The covers shall also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

REAR BODY PANEL

The rear body panel shall extend the full width between the side compartments. This panel shall be full height from the rear step compartment to the hose bed floor. The panel shall be bolted on and removable, with no part of the rear panel attached to the booster tank. The rear body panel material shall be aluminum treadplate as standard, if Chevron striping is specified for the rear of the body then smooth aluminum shall be utilized.

BODY RUB RAILS

Sacrificial aluminum tread plate rub rails shall be mounted at the base of the body, extend outward a minimum 3/4", downward 2" and flange inward 1". The rub rails shall extend the full length of the main body and wrap around the rear body corners. Rub rails shall be designed to bolt to the body from the bottom side of the compartment area, so as not to damage the body side panels on initial impact and to provide for ease of replacement.

RUNNING BOARD STEPS

The driver and officer running board steps shall be fabricated of 3/16" polished aluminum tread plate. The outside edge on each step shall be fabricated with a double break, return flange. The steps shall be rigidly reinforced with a heavy duty support structure. The running boards shall not form any part of the compartment design, and shall be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

OFFICER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum with a slatted aluminum bottom, shall be recessed into the officer's side running board. The storage well shall measure 9" deep x 9" wide x as long as possible between the running board support members. Drain holes shall be located in the bottom corners to allow water to drain from the storage well.

The officer's side running board hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

DRIVER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum with a slatted aluminum bottom, shall be recessed into the driver's side running board. The storage well shall measure 9" deep x 9" wide x as long as

possible between the running board support members. Drain holes shall be located in the bottom corners to allow water to drain from the storage well.

The driver's side running board hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

REAR STEP

The rear step shall be fabricated from 3/16" polished aluminum tread plate, and shall be rigidly reinforced. The rear step shall extend 12" past the rear edge of the body, and shall be 100" wide, with square corners.

The rear edge of the step shall be designed to accommodate the rear clearance lights, recessed for protection in the step reinforcement channel. The step treadplate overlay shall be bolted to the step frame for ease of replacement.

INTERMEDIATE REAR STEP

A ten (10) inch bolt on intermediate rear step, fabricated from 3/16" aluminum tread plate, shall be installed. The step shall be a minimum of 10" deep x full width of the rear tailboard.

INTERMEDIATE REAR STEP

A twelve (12) inch bolt on intermediate rear step, fabricated from 3/16" aluminum tread plate, shall be installed. The step shall be a minimum of 10" deep x full width of the rear tailboard.

ISOLATED REAR STEP COMPARTMENT

An isolated rear step compartment measuring 40" high x 46" wide x 30" deep with a door opening of 38" high x 43-3/4" wide shall be provided at the rear of the apparatus.

The rear step compartment door shall be a roll-up door. The roll-up door shall be equipped with a brushed aluminum finish.

GRAB RAILS

All hand rails shall be 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

Molded gaskets shall be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

GRAB RAIL LOCATIONS:

Two (2) vertical rails shall be mounted on the rear edge of the beavertails, one (1) each side.

One (1) horizontal, full width handrail shall be installed on the rear, below the level of the hose bed.

FOLDING STEPS - FRONT OF BODY

Six (6) Trident lighted model 24.005.3 large folding steps, made of high strength aluminum, with a bright finish and black non-skid inlay shall be provided on the front face of the running board compartments, above running board steps, three (3) each side. Each step shall have a built in LED light at

the top of the step that shall be activated when the parking brake is applied. The steps shall be mounted to accommodate access to the body hose bed area with a maximum of 18" height between each step. Each step shall meet the minimum of 42 in² surface area, conforming to NFPA-1901 requirements.

FOLDING STEPS - REAR OF BODY

Six (6) Trident lighted model 24.005.3 large folding steps, made of high strength aluminum, with a bright finish and black non-skid inlay shall be provided provided on the rear of the body, three (3) each side. Each step shall have a built in LED light at the top of the step that shall be activated when the parking brake is applied. The steps shall be mounted to accommodate access to the body hose bed area with a maximum of 18" height between each step. Each step shall meet the minimum of 42 in² surface area, conforming to NFPA-1901 requirements.

SAFETY SIGN(S) AT REAR STEP AND CROSS WALKWAY(S)

Safety sign(s) shall be located on the vehicle at the rear step, and at any cross walkway(s), to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

REAR WHEEL WELL LINERS

Fully removable, bolt-in, 1/8" aluminum fender liners shall be provided. The wheel well liners shall extend from the outer wheel well body panel, into the truck frame. Removable vertical splash shields, inward of the wheels, shall be provided to give access to the hydraulic components. The completely washable fender liners shall be designed to protect the front and rear compartments and main body supports from road salts, dirt accumulation and corrosion.

REAR FENDERETTES

The rear fenders shall be equipped with easily replaceable, polished extruded aluminum fenderettes. The fenderettes shall be equipped with a rubber gasket molding between the body panel and the fenderette.

AIR BOTTLE STORAGE COMPARTMENTS

A total of five (5) SCBA air bottle storage compartments (8" high x 8" wide x 26" deep) shall be inserted into the body fender area on a 5 degree pitch. The compartments shall be located with two (2) on the driver side and three (3) on the officer side of the rear body fender panels. The lower portion of the compartments shall be non-abrasive to absorb shock and help secure the bottle.

Each storage compartment shall be equipped with a polished stainless steel door.

AIR BOTTLE STORAGE COMPARTMENTS

A total of six (6) SCBA air bottle storage compartments (8" high x 8" wide x 26" deep) shall be inserted into the body fender area on a 5 degree pitch. The compartments shall be located with three (3) on the driver side and three (3) on the officer side of the rear body fender panels. The lower portion of the compartments shall be non-abrasive to absorb shock and help secure the bottle.

Each storage compartment shall be equipped with a polished stainless steel door.

***** BODY FENDER STORAGE COMPARTMENTS *****

DRIVER FRONT FENDER STORAGE

A storage compartment shall be inserted into the front driver side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive lined floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

OFFICER FRONT FENDER STORAGE

A storage compartment shall be inserted into the front officer side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

OFFICER REAR FENDER STORAGE

A storage compartment shall be inserted into the rear officer side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

DRIVER REAR FENDER STORAGE

A storage compartment shall be inserted into the rear driver side body fender. The compartment shall be sized large enough to store two (2) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive floor area for the two (2) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

REAR MUD FLAPS

Heavy duty mud flaps shall be provided behind the rear wheels.

REAR TOW EYES

Two (2) painted tow eyes shall be furnished on the rear of the vehicle. The tow eyes shall be made from plate steel and shall be bolted directly to the chassis frame rails with grade 8 bolts and shall extend below the body. The tow eyes shall be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

WINCH RECEIVER POINT - EACH SIDE OF THE BODY

A receiver point shall be provided beneath the rub rail toward each side of the Rescue body for a portable winch. The receiver point shall be a 2 1/2" x 2 1/2" x 1/4" full width of body seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to four points on the chassis frame rails. A 12V electrical connection with a quick disconnect compatible with the portable winch shall be provided adjacent to the receiver point. A plastic end cap shall be provided for the quick disconnect.

HOSE BED (76" WIDE)

The hose bed shall be located directly above the booster tank and shall be free from all sharp objects such as bolts, nuts, etc., to avoid damage to fire hose.

For added strength, rigidity and appearance, the hose bed side walls shall have the top edge flanged outward two (2) inches and downward one (1) inch. In a similar fashion, the top edge of the front wall shall be flanged inward two (2) inches and downward one (1) inch.

The hose bed shall provide a minimum 30 cubic feet hose storage area for 2 ½" or larger fire hose to meet NFPA 1901 minimum pumper hose storage requirement.

The apparatus weight analysis shall be based on 800' of 2 ½" hose unless otherwise specified. If the hose load to be carried exceeds this minimum, the purchaser shall advise the manufacturer prior to contract so adequate chassis carrying capacity can be provided.

HOSE BED FLOORING

Flooring to be constructed from extruded aluminum and be properly spaced for ventilation. The flooring shall be smooth and free from sharp edges to avoid hose damage. The hose bed floor shall be removable to provide access to inner body framework.

HOSE BED PARTITIONS

Three (3) fully adjustable, 3/16" brush finish, aluminum hose bed partitions shall be provided. Partitions shall be removable for access to booster tank.

The top and rear edge of each of the adjustable hose bed partitions shall have an integral tubing reinforcement welded on for additional support.

HOSE BED COVER, ALUMINUM TREAD PLATE ROLLING/LIFT UP COVER

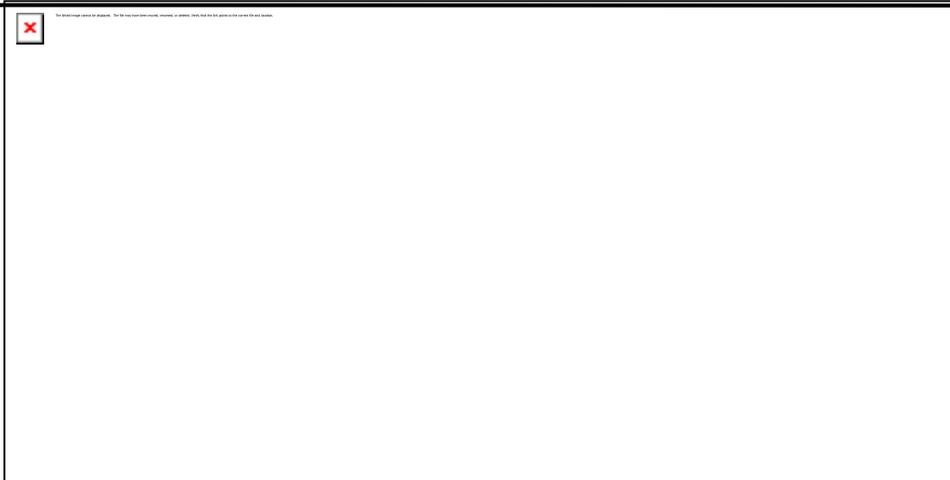
The top of the hosebed shall have an NFPA compliant cover installed to secure the hose from unintentionally deploying out the top or rear of the hosebed. The cover shall be a polished aluminum tread plate combination roller/lift-up style cover. The cover shall be capable of supporting 250 lbs at any single point on the cover. The rear half of the cover shall roll back over the forward half of the cover on channel tracks and sealed ball bearing nylon coated rollers. When rolled open, the entire cover shall be capable of being lifted up on a stainless steel piano hinge installed across the front of the body. The cover shall raise to no less than 60 degrees for loading hose.

The cover shall lock in the closed position. When unlocked, the roller portion of the cover shall be capable of rolling forward and locking into the open rolled position. The lift portion shall be assisted and supported by positive locking gas charged struts on each side of the cover.

Handles shall be installed on the end of the cover to assist with rolling and lifting.

Switches shall be installed on each side of the cover to indicate when the cover is open which shall activate the "Do Not Move Apparatus" warning in the cab.

An individual hinged access door shall be provided over the water tank fill tower area. This door shall be hinged at the front to prevent the door from opening while the apparatus is in motion. The door shall not be latched to allow the door to pop open in the event of tank over pressurization.



****** COMPARTMENT ACCESSORIES ******

ADJUSTABLE SHELVING

Compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in aluminum strut channel.

Adjustable shelves shall be located as follows:

- Three (3) in the driver side front compartment
- One (1) in the officer side front compartment
- Two (2) in the driver side rear compartment
- One (1) in the officer side rear compartment
- One (1) in the officer side front high side compartment
- One (1) in the officer side rear high side compartment
- One (1) in the driver side over the wheel high side compartment
- One (1) in the rear step compartment

HALF DEPTH SLIDE OUT FLOOR MOUNT SHELVING

Half depth slide out floor mount compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports attached to #250 rated slides. The half depth slide out floor mount shelving shall have gas shocks to hold the tray in and out.

Half depth slide out floor mount shelving shall be provided as follows:

- One (1) in the driver side rear compartment

500 POUND FLOOR MOUNTED ROLL OUT TRAYS

Floor mounted roll-out trays shall consist of heavy duty, roller bearing slide tracks with an end load rating of 500 pounds, securely fastened to the compartment floor. The tray shall be fabricated from 3/16" brushed aluminum with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray. The slide tracks shall have a 70% extension.

The 500 pound floor mounted roll out trays shall be located as follows:

500 POUND FLOOR MOUNTED ROLL OUT TRAYS

Floor mounted roll-out trays shall consist of heavy duty, roller bearing slide tracks with an end load rating of 500 pounds, securely fastened to the compartment floor. The tray shall be fabricated from 3/16" brushed aluminum with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray. The slide tracks shall have a 100% extension, allowing the tray to extend out of the compartment completely.

The 500 pound floor mounted roll out trays shall be located as follows:

One (1) in the rear step compartment

ADJUSTABLE ROLL-OUT TRAY

Roll out adjustable compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports attached to 250# rated slides. Slide out adjustable shelving shall be vertically adjustable with spring nuts in aluminum strut channel. Slide out adjustable shelving shall have gas springs to hold in and out.

The adjustable roll-out trays shall be located as follows:

VERTICAL DIVIDERS

Full height, fixed mounted, vertical compartment dividers shall be fabricated from 3/16" brushed aluminum material. The dividers shall extend the full depth of the specified compartment from the floor to the compartment ceiling.

Full height, vertical dividers shall be located as follows:

One (1) full height fixed divider(s) shall be located as directed by the fire department

SWING OUT TOOL BOARD(S)

One (1) swing out tool board(s) shall be provided and mounted as directed by the fire department. The tool board(s) shall be constructed of 3/16" smooth aluminum allowing mounting of equipment on the interior and exterior of the tool board(s). The tool boards shall be installed with a Performance Advantage Company PM-1000 Swing-Out Module Kit. Aluminum angles shall attach the hinges to Unistrut tracking to allow depth adjustments. A heavy duty thumb latch shall be provided to secure the tool board(s) in the closed position.

VERTICAL PULL OUT TOOL BOARD

One (1) vertical pull out tool board(s) shall be provided and mounted as directed by the fire department. The tool board(s) shall be constructed of 3/16" smooth aluminum allowing mounting of equipment on both sides of the tool board(s). The tool board shall be attached to #250 rated slides, one at the top and one at the bottom of the tool board. 3/16" aluminum angles shall attach the slides to tracking to allow horizontal adjustments. A gas shock shall be used to secure the tool board in the stored and deployed position.

TURTLE TILE

Turtle Tile brand floor material shall be installed on all compartment floors. The Turtle Tile shall be custom installed to provide full floor coverage.

The compartment flooring color shall be black.

****120/240 VOLT A.C. ELECTRICAL AND GENERATOR SECTION ****

120/240 VOLT ELECTRICAL SYSTEM TESTING

All line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test shall be conducted between live parts and the neutral conductor and between live parts and the vehicle frame with any switches in the circuits closed. The test shall be conducted after all bodywork has been completed. The dielectric tester shall have a minimum 500 VA transformer with a sinusoidal output voltage that can be verified.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

OPERATIONAL TESTING

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

The generator shall be started from a cold start condition and the line voltage electrical system shall be loaded to 100 percent of the nameplate voltage rating.

The following items shall be monitored and documented every 15 minutes:

- The cranking time until the generator starts and runs.
- The voltage, frequency, and amperes at continuous full rated load.
- The generator oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery rate charge, as applicable.
- The ambient temperature and altitude.

The generator shall operate at 100 percent of its nameplate wattage for a minimum of two (2) hours.

HARRISON 10,000-WATT HYDRAULIC DRIVEN GENERATOR

One (1) Harrison Hydraulic Driven Generator model number 10.0MAS-16R rated at 10000 watts, 40/80 amps, 120/240VAC, 60 Hz, 1-phase shall be provided.

The system shall be designed and assembled by a company with no less than 10 years experience in the manufacture of hydraulic driven generators. The system shall be tested at the full nameplate load prior to shipping and be accompanied with the test report. The test report shall document the generators performance at various loads from no load to full load to ensure reliable power delivery at those loads.

The motor/generator shall be placed in a frame which affords protection to the components and provides a unitized mounting module containing the motor/generator, reservoir, oil cooler, filtration, on/off manifold containing a cross port check valve allowing unit to be started and shut down remotely.

The generator shall be a commercial type with a heavy-duty bearing and of brush less design to ensure low maintenance. No brushes or slip rings shall be allowed. The reservoir shall include an oil level sight gauge, oil temperature gauge; fill cap, oil filter, and a venturi boost unit to provide positive pressure to the pump suction port.

The generator and motor shall be close coupled and aligned using a Morse taper with a through bolt to secure the motor to the generator. No two (2) bearing generators shall be permitted.

The system must be capable of producing the full nameplate power when driven from the vehicle PTO from idle to maximum engine speed.

The generator system must be able to operate on either a Constant Engaged PTO or a Hot Shift PTO. The generator must be able to be used while vehicle is either stationary or in motion.

The hydraulic motor and pump shall be of axial piston design to provide low internal leakage and a high degree of frequency stability. No gear pumps or motors shall be used. The pump shall match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands.

The system shall be capable of normal operations using a commonly available ATF fluid, such as GM Dextron III or equivalent. All fluid service points shall be in close proximity to the reservoir for ease of scheduled maintenance.

When properly installed, the system shall be warranted for a period of not less than two (2) years or 2000 hours, whichever should come first.

The generator shall be able to remotely turn systems full kW on or off without regard to engine RPM by using a 12VDC switch. The switch shall be mounted in the cab dash.

A weatherproof digital Quadra meter containing the volt, amp, and frequency shall be installed near the breaker panel.

GENERATOR PTO

A hot shift PTO shall be provided on the transmission for the Harrison generator. The PTO shall be controlled from the cab. The control shall include a PTO engagement switch and a PTO engaged indicator light.

GENERATOR WARRANTY

The specified generator shall have a two (2) year or two thousand (2000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty shall be provided at time of delivery.

GENERATOR LOCATION

The generator shall be permanently mounted in the officer side walkway storage compartment and will be equipped with perforated or louvered panels for proper ventilation.

Locating the generator greater than 144" from the main breaker panel may require the installation of an additional power disconnecting means.

120/240 VOLT LOAD CENTER

The generator output line conductors shall be wired from the generator output connections to a Square D, model #QO112L125G breaker panel. The breaker panel shall be equipped with a properly sized main breaker using two (2) of the twelve (12) spaces which leaves a total of ten (10) available spaces.

The generator output conductors shall be sized to 115% of the main breaker rating and shall be installed as indicated in the wiring section.

Ten (10) appropriately sized, 120 volt, circuit breakers shall be provided.

The breaker panel shall be located on the rear wall of the driver side upper compartment.

120/240 VOLT WIRING METHODS

Wiring/conduit shall not be attached to any chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components or low voltage wiring.

All wiring shall be installed at a minimum of 12 inches away from any exhaust piping and a minimum of 6 inches from any fuel lines.

All wiring shall be securely clamped within 6 inches of any junction box and at a minimum of every 24 inches of run. All supports shall be of nonmetallic material or corrosion protected metal. All supports shall not cut or abrade conduit or cable and shall be mechanically fastened to the vehicle.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115% of the main breaker rating.

All Type SO or Type SEO cable not installed in a compartment shall be installed in wire loom. Where Type SO or Type SEO cable penetrates a metal surface, a rubber or plastic grommet or bushing shall be provided.

The installation of all 120/240 wiring shall meet the current NFPA-1901 Standards .

120/240 VOLT WIRING IDENTIFICATION

All line voltage conductors located inside the main breaker panel box shall be individually and permanently identified. When pre-wiring for future power wiring installations, the non-terminated ends shall be labeled showing function and wire size.

120/240 VOLT GROUNDING

The neutral conductor of the power source shall be bonded to the vehicle frame only at the power source.

The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray.

In addition to the bonding required for the lower voltage return current, each body and driving/crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. The conductor shall have a minimum amperage rating of 115 percent of the name plate current rating of the power source specification label.

120/240 VOLT CIRCUIT BREAKER / RECEPTACLE INSTALLATION

The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. When multiple circuit are required, the circuits shall be wired to the breaker panel in a staggered configuration to minimize electrical loads on each breaker or generator (leg) circuit. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage.

120/240 VOLT RECEPTACLE INSTALLATIONS

Any receptacle installed in a wet location must be a minimum of 24 inches above the ground and provided with an approved wet location cover. Wet receptacles may not be mounted at more than 45 degrees from vertical, nor can they be mounted in a face-up position.

ELECTRIC CABLE REEL

One (1) Akron Brass Model #ERWC-15-10 electric, 120 volt, electric rewind cord reel (able to accommodate 200 feet of 10 gauge or 250 feet of 12 gauge electric cable). The reel shall be provided and wired to the breaker panel. The reel shall be equipped with a universal frame that shall allow the 12 volt motor to be mounted in four different positions. The customer shall have the ability to move the motor from front to back or side to side without having to purchase extra parts. The reel shall be securely mounted and equipped with a rewind control adjacent to the reel.

The cord reel shall be ceiling mounted in the body roof compartments. The reel shall be mounted on the floor in the roof compartment and guided to the side body compartment directly below the reel.

A 4-way stainless steel captive roller assembly shall be bolted to the compartment ceiling, below the reel to allow the hose to be guided on/off to the reel properly.

The circuit breaker used to protect any device attached to the cord reel shall be sized to the smallest electrical connection used.

ELECTRIC CABLE

Two hundred (200) feet of Type SO yellow 10/3 heavy duty electric cable shall be provided on the reel.

JUNCTION BOX(ES)

Two (2) Circle-D Model #PF51G-5, four (4) outlet junction box(es) with four (4) NEMA L5-20R twist-lock receptacles direct wired on the end of the cable shall be provided.

CABLE ROLLER ASSEMBLY

Two (2) four (4) roller assembly(s) shall be provided adjacent to each cord reel to provide unobstructed deployment and rewinding of the cable.

Two (2) cable ball stop(s) shall be installed on the cable to keep the cable end from passing through the roller assembly.

The front brow lights shall be controlled from the following location(s):

- Cab dash, with 12 volt switch

LIGHTING (TELESCOPING) - ABOVE PUMP

Two (2) Fire Research NIGHTMASTER, model #LT510 top mounted, pull up scene light, deployable in a full 360 degree rotation. The entire assembly shall be UL listed as Scene light for Fire Service Use, manufactured by Fire Research. The tightening mechanism shall be of a twist lock (concentric ring) design, the use of a knob or latch to release the pole in order to raise and lower the telescoping portion of the pole shall not be accepted.

The lights shall be mounted above the pump operator's panel in the pump enclosure, one (1) each side. Wiring used for the lighting shall be a minimum of 16 gauge three (3) wire cable that is properly supported and protected from damage.

Each Fire Research light shall be equipped with a model M, 1000 watt 240 VAC light head.

Two (2) model M, 1000 watt light heads shall require one (1) 240 V, 15 amp circuit breaker.

The lights above the pump panel shall be controlled from the following location(s):

- Pump panel, with 12 volt switch

LADDER STORAGE

The ground ladders shall be stored vertically next to the water tank, behind the side body compartments, on the officer side of the apparatus.

GROUND LADDERS

The following Alco-Lite ground ladder compliment shall be provided:

- One (1) Alco-Lite model PEL-24; 24', aluminum, two (2) section extension ladder shall be provided.
- One (1) Alco-Lite model PRL-14; 14', aluminum, straight roof ladder with folding hooks shall be provided.
- One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder shall be provided.

****** PIKE POLES AND HOLDERS ******

PIKE POLE STORAGE

Two (2) pike pole tube(s) shall be provided. Each holder shall be equipped with a spring type holder and shall be accessible from the rear of the apparatus. Each pike pole holder shall be labeled to indicate the pike pole length.

The pike pole tube(s) shall be mounted in the ladder storage compartment.

SUCTION HOSE STORAGE

The suction hoses shall be located beneath the hose bed, one (1) on the driver side and one (1) on the officer side. The hose storage area shall be accessed from the rear of the apparatus. The storage area shall be enclosed with a hinged door on the rear of the body.

Note: On bodies with rollup style doors this storage area shall be behind the roll of the door and will not affect usable compartment space. On bodies with hinged style doors this storage area shall be in the top corner of the compartment.

SUCTION HOSE

Two (2) 10 foot sections of six (6) inch PVC lightweight suction hose shall be furnished (Kochek or Firequip Maxi-Flex). Suction hose shall be for suction only and not to be used on pressurized hydrants or for relay pumping. Couplings shall include a long handle, female swivel on one end and a rocker lug male on the other end. All threads shall be six (6) inch N.S.T.

NOTE: All PVC suction hoses are strictly drafting hoses and must not be used on hydrants or in pressure applications, as serious personal injury or death may occur.

STRAINER

One (1) 6" NST low level type strainer(s) with integral jet siphon shall be provided to attach to the suction hose. A compartment mounting bracket shall also be provided to store the strainer(s) when not in use.

HYDRANT ADAPTER

A double female swivel hydrant adapter shall be provided along with a screw base mounting bracket. One end shall attach to the suction hose and the other end to be 4-1/2" N.S.T. thread.

ADDITIONAL ITEMS SUPPLIED WITH THE VEHICLE

- 1 - Pint of touch up paint for each color
- 1 -Bag of assorted stainless steel nuts and bolts

LOOSE EQUIPMENT

The following items shall be provided and shipped loose with the completed apparatus at the time of delivery:

HAND LIGHT

Four (4) Streamlight model "Vulcan" C4 LED rechargeable hand light(s) and 12 volt charger shall be installed as directed by the purchaser. Charger shall be wired to the chassis battery system.

Lights are to be mounted just above floor level below the middle EMS compartment in the rear of the cab in front of the forward facing seats.

Streamlight HID Litebox:

A Streamlight HID Litebox with 12v Charger (Part No. 45605) will be provided and mounted on the rear wall of cab directly behind the driver between the door and the forward facing seat.

WHEEL CHOCKS

Two (2) ZICO #SAC-44 folding wheel chocks shall be mounted forward of the rear wheels on the driver side below the side running board compartments.

**** PAINT SECTION ****

PAINT, PREPARATION AND FINISH

The PPG Delta, Low V.O.C., polyurethane finishing system, or equal, shall be utilized. A "Clear Coat" paint finish shall be supplied to provide greater protection to the quality of the exterior paint finish.

All removable items, such as brackets, compartment doors, etc. shall be painted separately to insure finish paint behind mounted items. All compartment unwelded seams exposed to high moisture environments shall be sealed using permanent pliable caulking prior to finish paint.

BODY PRIMER & PREPARATION

All exposed welds shall be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized. After final body work is completed, grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

BODY FINISH PAINT

The body shall be finish sanded and prepared for final paint. Upon completion of final preparation, the body shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The entire body shall be buffed and detailed.

BODY PAINT

The inside and underside of the complete body assembly shall be painted job color prior to installation of the body on the chassis or torque box. The body paint finish will be PPG Delta System in a single color, to match customer furnished paint codes and requirements.

COMPARTMENT PAINT

The interior of the body compartments shall be painted with Line-X material.

The Line-X coating shall be light gray in color.

BODY PAINT

The body paint finish shall be PPG Delta System in a single color, to match customer furnished paint codes and requirements.

PUMP / PIPING PAINT

The pump enclosure and pump/plumbing within the pump enclosure shall be painted job color to match the primary color of the body.

CAB PRIMER & PREPARATION

The cab primer shall be a two (2) stage process. First stage shall be a coating with a two part component, self etching, and corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage shall be multiple coats of a catalyzed, two component, polyurethane primer applied for leveling of small imperfections and top coat sealing.

CAB FINISH PAINT

The entire cab shall be finish sanded and prepared for final paint. Upon completion of final preparation, the cab shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The cab exterior shall be painted with PPG Delta system to match purchaser's furnished paint codes. A two-tone paint finish shall be provided with the two-tone break line located approximately 3" below the cab side windows.

The entire exterior finish of the cab shall be buffed and detailed.

CAB INTERIOR PAINT

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

CHASSIS PAINT

The chassis frame rails, running gear, pump and plumbing shall be painted with Polyurethane paint to match the body color code prior to the installation of any air lines or electrical system to ensure serviceability.

WHEEL PAINT

The chassis wheels, (except aluminum wheels) shall be painted job color with silver trim around the perimeter.

Wheel Well Paint

Wheel wells will be painted job color.

PAINT CODES

The paint shall match customer furnished paint code(s) and layout. The paint code(s) shall be as indicated below:

- **PRIMARY PAINT COLOR**

Single Color: *TBD* *Paint Code#* *TBD*

- **SECONDARY PAINT COLOR**

Two/Tone Color: *TBD* *Paint code#* *TBD*

TOUCH-UP PAINT

One (1) pint of each exterior color paint for touch-up purposes shall be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery the vehicle, the interior and exterior be cleaned and detailed. The finalization process detailing shall include installation of NFPA required labels, checking fluid levels, sealing and caulking required areas of the cab and body, rust proofing, paint touch-up, etc.

RUST PROOFING

The entire unit shall be thoroughly rust proofed utilizing rustproof and sound deadening materials applied in manufacturer recommended application procedures. Rust proofing shall be applied during the assembly process and upon completion to insure proper coverage in all critical areas.

**** LETTERING AND STRIPING ****

COMPUTER GENERATED LETTERING

The lettering and striping shall be custom designed utilizing state of the art computer software and computerized cutting machines. The manufacturer shall employ a full time artist / designer to generate all lettering, decals, and striping to meet the requirements of the Fire Department. The artwork for the lettering and striping shall be kept on record by the apparatus manufacturer to allow for ease in duplication for the Fire Department.

LETTERING FONT

The lettering shall be designed and cut with a basic block type font:

"BLOCK TYPE FONT"

**** NFPA REQUIRED SCOTCH-LITE STRIPING ****

SCOTCH-LITE STRIPE

A six (6) inch high "Scotch-Lite" stripe shall be provided. The stripe shall be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit. The Scotch-Lite stripe layout shall be determined by the Fire Department.

The Scotch-Lite shall be white in color.

SCOTCH-LITE ACCENT STRIPES

A 1" high Scotch-Lite material accent stripe shall be incorporated into the Scotch-Lite scheme to border the primary Scotch-Lite stripe on the top and bottom edges. Final layout of this configuration shall be determined by the Fire Department.

REAR CHEVRON STRIPING

At least 50% of the rear facing vertical surface shall be covered with alternating strips of reflective striping.

The striping shall be 6" Diamond Grade Scotch-Lite.

The Diamond Grade Scotch-Lite shall be Red #983-72 and Fluorescent Yellow Green #983-23 in color.



CAB ROOF LETTERING

KME will install adhesive lettering 'E82' in four (4) foot letters as directed on the top of the cab. Color shall be black.

******* WARRANTIES & REQUIRED INFORMATION *******

KME CHASSIS

The proposed vehicle includes a one (1) year new vehicle warranty, upon delivery and acceptance of the vehicle. The warranty will ensure that the vehicle has been manufactured to the proposed contract specifications and will be free from defects in material and workmanship that may appear under normal use and service within the warranty period. The warranty may be subject to different time and mileage limitations for specific components and parts. This warranty is issued to the original purchaser of the vehicle.

The warranty will not apply to tires, batteries, or other parts or components that are warranted directly by their manufacturers. The warranty will not apply to routine maintenance requirements as described in the service and operators manual. No warranty whether express, implied, statutory or otherwise including, but not limited to any warranty of merchantability or fitness for purpose will be imposed.

OVERALL UNIT AND CUSTOM CHASSIS

All components and parts of the vehicle are warranted for a period of one (1) year from acceptance of the vehicle, unless excluded elsewhere in this warranty or described as having longer time limitations.

ENGINE

The proposed unit will be equipped with a Fire Service rated engine, which will come furnished with a five (5) year Engine Manufacturer's warranty. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

TRANSMISSION

The proposed Allison transmission will be provided with a five (5) year warranty. A copy of the Allison transmission warranty will be supplied to the purchaser to define additional details of the warranty provisions.

CUSTOM CHASSIS FRAME RAILS

The proposed KME custom chassis frame and cross members will be warranted for an unlimited time period. A copy of KME's frame rail warranty will be supplied to define additional details of the warranty provisions.

STEERING UNIT

The proposed Sheppard steering gear will be warranted for a period of one(1) year from the first date of service or 100,000 miles (160,000 kilometers), whichever occurs first. The product will be free from defects in material and workmanship under normal use in applications approved in advance by Sheppard.

FRONT AXLE

The Meritor axle will be provided with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings will have a one (1) year warranty. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions.

REAR AXLE

The Meritor axle will be provided with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings will have a one (1) year warranty. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions.

CAB STRUCTURE

The proposed cab will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

BODY STRUCTURE

The proposed body will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

CORROSION

The proposed cab and body will be warranted against rust-through or perforation, due to corrosion from within, for a period of ten (10) years. Perforation is defined as a condition in which an actual hole occurs in a sheet metal panel due to rust or corrosion from within. Surface rust or corrosion caused by chips or scratches in the paint is not covered by this warranty.

PAINT

The proposed paint finish will be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

REAR SUSPENSION

KME hereby warrants to the original Buyer, that leaf spring products installed will be free of defects in material and workmanship for one (1) year. The "Warranty Period" commences on the date the original Buyer takes delivery of the product from the manufacturer.

WATER TANK

The proposed water tank will be warranted by the water tank manufacturer for the "Lifetime" of the unit. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale will be free of defects in material and workmanship for a period of five (5) years from the date product is first placed into service or five and one-half (5 1/2) years from date of shipment by Hale, whichever period will be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

HEAVY DUTY VALVES

Akron Brass warrants Heavy Duty Swing-Out Valves for a period of ten (10) years after purchase against defects in material or workmanship. Akron Brass will repair or replace any Heavy Duty Swing Out Valve which fails to satisfy this warranty.

SEATING

HO Bostrom will warrant each new seat manufactured, to be free from defects in materials and workmanship when delivered to the original purchaser for a period of five (5) years.

Labor to remove or reinstall and transportation of defective items will not be covered by, or any allowance made for said cost under this warranty.

NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2009 edition in accordance with the applicable requirements unless supplied by the manufacturer or sales rep organization, will be provided by the fire department. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

Section 5.7 Equipment.

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.1 Ground Ladders.

5.7.1.1 All fire department ground ladders carried on the apparatus shall meet the requirements of NFPA 1931, Standard for Manufacturer's Design of Fire Department Ground Ladders, except as permitted by 5.7.1.3 and 5.7.1.4.

5.7.1.2 At a minimum, the following fire department ground ladders shall be carried on the apparatus:

- (1) One straight ladder equipped with roof hooks
- (2) One extension ladder
- (3) One folding ladder

5.7.1.3 Stepladders and other types of multipurpose ladders meeting ANSI A14.2, Ladders - Portable Metal- Safety Requirements, or ANSI A14.5, Ladders - Portable Reinforced Plastic Safety Requirements, with duty ratings of Type IA or IAA shall be permitted to be substituted for the folding ladder required in 5.7.1.2(3).

5.7.1.4 Stepladders and other types of multipurpose ladders shall be permitted to be carried in addition to the minimum fire department ground ladders specified in 5.7.1.2 provided they meet either ANSI A14.2 or ANSI A14.5 with duty ratings of Type 1A or 1AA.

Section 5.7.2 Suction Hose or Supply Hose.

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.2.1 A minimum of 20 ft (6 m) of suction hose or 15 ft (4.5 m) of supply hose shall be carried.

5.7.2.1.1 Where suction hose is provided, a suction strainer shall be furnished.

- 5.7.2.1.2 Where suction hose is provided, the friction and entrance loss of the combination suction hose and strainer shall not exceed the losses listed in Table 16.2.4.1 (b) or Table 16.2.4.1(c).
- 5.7.2.1.3 Where supply hose is provided. It shall have couplings compatible with the local hydrant outlet connection on one end and the pump intake connection on the other end.
- 5.7.2.2 Suction hose and supply hose shall meet the requirements of NFPA 1961, Standard on Fire Hose.

Section 5.8 Minor Equipment.

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.8.2 Fire Hose and Nozzles. The following fire hose and nozzles shall be carried on the apparatus:

- (1) 800 ft (240 m) of 2 1/2 in. (65 mm) or larger fire hose
- (2) 400 ft (120 m) of 1 1/2 in. (38 mm), 1 3/4 in. (45 mm), or 2 in. (52 mm) fire hose
- (3) One handline nozzle. 200 gpm (750 L/min) minimum
- (4) Two handline nozzles. 95 gpm (360 L/min) minimum
- (5) One playpipe with shutoff and 1 in. (25 mm), 1 1/8 in. (29 mm), and 1 1/4 in. (32 mm) tips

5.8.3 Miscellaneous Equipment. The following additional equipment shall be carried on the apparatus:

- (1) One 6 lb (2.7 kg) flathead axe mounted in a bracket fastened to the apparatus
- (2) One 6 lb (2.7 kg) pickhead axe mounted in a bracket fastened to the apparatus
- (3) One 6 ft (2 m) pike pole or plaster hook mounted in a bracket fastened to the apparatus
- (4) One 8 ft (2.4 m) or longer pike pole mounted in a bracket fastened to the apparatus
- (5) Two portable hand lights mounted in brackets fastened to the apparatus
- (6) One approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus
- (7) One 2 1/2 gal (9.5 L) or larger water extinguisher mounted in a bracket fastened to the apparatus
- (8) One self-contained breathing apparatus (SCBA) complying with NFPA 1981, Standard on Open-Circuit Self Contained Breathing Apparatus (SCBA) for Emergency Services, for each assigned seating position. But not fewer than four, mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer
- (9) One spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space
- (10) One first aid kit
- (11) Four combination spanner wrenches mounted in brackets fastened to the apparatus
- (12) Two hydrant wrenches mounted in brackets fastened to the apparatus
- (13) One double female 2 1/2 in. (65 mm) adapter with National Hose (NH) threads, mounted in a bracket fastened to the apparatus
- (14) One double male 2 1/2 in. (65 mm) adapter with NH threads, mounted in a bracket fastened to the apparatus
- (15) One rubber mallet, suitable for use on suction hose connections, mounted in a bracket fastened to the apparatus
- (16) Two salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m)
- (17) Two or more wheel chocks. Mounted in readily accessible locations, that together will hold the apparatus. When loaded to its GVWR or GCWR, on a hard surface with a 20 percent grade with the transmission in neutral and the parking brake released
- (18) One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and have a five-point breakaway feature that includes two at the shoulders, two at the sides, and one at the front
- (19) Five fluorescent. orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) band

- (20) Five illuminated warning devices such as highway flares, unless the live fluorescent orange traffic cones have illuminating capabilities
- (21) One automatic external defibrillator (AED)

- 5.8.3.1 If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, shall be carried mounted in brackets fastened to the apparatus.
- 5.8.3.2 If none of the Pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side shall be carried. Any intake connection larger than 3 in. (75 mm) shall include a pressure relief device that meets the requirements of 16.6.6.
- 5.8.3.3 If the pumper is equipped with an aerial device with a permanently mounted ladder, four ladder belts meeting the requirements of NFPA 1983, Standard on Life Safety Rope and Equipment for Emergency Services shall be provided.
- 5.8.3.4 If the apparatus does not have a 2 1/2 in. intake with NH threads, an adapter from 2 1/2 in. NH female to a pump intake shall be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- 5.8.3.5 If the supply hose carried has other than 2 1/2 in. NH threads, adapters shall be carried to allow feeding the supply hose from a 2 1/2 in. NH thread male discharge and to allow the hose to connect to a 2 1/2 in. NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

14.1.8.4 Fire Helmet.

It is the responsibility of the purchaser to ensure that "Fire helmets shall not be worn by persons riding in enclosed driving and crew areas any time the apparatus is placed in service.

- 14.1.8.4.1 A location for helmet storage shall be provided.
- 14.1.8.4.2 If helmets are to be stored in the driving or crew compartment, the helmets shall be secured in compliance with 14.1.11.2.

14.1.10 SCBA Mounting.

It is the responsibility of the purchaser to ensure that any SCBA equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

- 14.1.10.1 Where SCBA units are mounted within a driving or crew compartment, a positive latching mechanical means of holding the SCBA device in its stowed position shall be provided such that the SCBA unit cannot be retained in the mount unless the positive latch is engaged.
- 14.1.10.2 The bracket holding device and its mounting shall retain the SCBA unit when subjected to a 9 G force and shall be installed in accordance with the bracket manufacturer's requirements.
- 14.1.10.3 If the SCBA unit is mounted in a seatback, the release mechanism shall be accessible to the user while seated.

14.1.11 Equipment Mounting.

It is the responsibility of the purchaser to ensure that any equipment installed on the apparatus by them or their subcontractor meets the following requirements prior to placing it in service.

- 14.1.11.1 All equipment required to be used during an emergency response shall be securely fastened.
- 14.1.11.2 All equipment not required to be used during an emergency response, with the exception of SCBA units, shall not be mounted in a driving or crew area unless it is contained in a fully enclosed and latched compartment capable of containing the contents when a 9 G force is applied in the longitudinal axis of the vehicle or a 9G force is applied in any other direction, or the equipment is mounted in a bracket(s) that can contain the equipment when the equipment is subjected to those same forces.

Section 15.9.3 Reflective Striping.

It is the responsibility of the purchaser to ensure that Reflective Striping has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

15.9.3.1" A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the apparatus.

15.9.3.1.1 The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

15.9.3.1.2 The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

15.10 Hose Storage.

It is the responsibility of the purchaser to ensure that any hose storage area includes a positive means to prevent unintentional deployment in order to achieve compliance with the standard prior to placing it in service.

15.10.7 Any hose storage area shall be equipped with a positive means to prevent unintentional deployment of the hose from the top, sides, front, and rear of the hose storage area while the apparatus is underway in normal operations.