

LEASE PURCHASE AGREEMENT

THIS AGREEMENT is made and entered into by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado (the “City”) and **FRONT RANGE FIRE APPARATUS, LIMITED**, a Colorado corporation whose address is 7600 Miller Ct., Frederick, Colorado, 80504 (“Contractor”).

RECITALS:

1. The City desires to obtain response vehicles for the Denver Fire Department and associated equipment (cumulatively, the “Equipment”), and Contractor desires to provide that Equipment to the City.
2. The City intends to finance and pay for the acquisition of the Equipment through a separate lease-purchase agreement (the “LPA”) between the City and JPMorgan Chase Bank, N.A. (the “Bank”).

AGREEMENT:

For and in consideration of the agreements contained herein and subject to the terms and conditions stated, in this Agreement, the parties agree as follows:

The recitals set forth above are incorporated herein as set forth in their entirety.

1. **FORM OF AGREEMENT**. This Agreement shall consist of the terms and conditions stated in the following numbered Articles, together with those exhibits or attachments that are referenced and incorporated in such Articles. In the event that any conflict between the terms and conditions contained in this document and those contained in any exhibits or attachments shall occur, the terms and conditions of these numbered Articles shall be controlling.

2. **COORDINATION AND LIAISON**: Contractor agrees that during the term of this Agreement it shall fully coordinate the performance of this Agreement with the City, including the Executive Director of Department of Transportation and Infrastructure (“Manager”) or as otherwise directed by the City. Contractor understands that the Manager or designee is the City's representative under this Agreement through whom Contractor obligations performed under this Agreement shall be coordinated.

3. **EQUIPMENT AND WARRANTIES TO BE PROVIDED**.

A. Contractor shall provide to the City the Equipment and warranties listed and described on **Exhibit A** attached hereto (hereinafter referred to as the “Equipment” and “Warranties”).

B. It is understood and agreed that the Equipment and Warranties associated with this Agreement that are being provided to the City hereunder are also routinely provided to nongovernmental customers on the same terms and conditions that were offered to the City and are agreed to by the City in this Agreement.

C. Upon delivery of the Equipment, the City will test and evaluate same to ensure that it conforms, in the City's reasonable judgment, to the specifications outlined in the exhibits. If the Equipment does not conform, the City will so notify Contractor in writing within sixty (60) days. Contractor will, at its expense, repair or replace the nonconforming product

within fifteen (15) days after receipt of the City's notice of deficiency. The foregoing procedure will be repeated until the City accepts or finally rejects the product, in whole or part, utilizing reasonable discretion. . In the event that the Equipment contains a defect or nonconformity not apparent on examination, the City reserves the right to repudiate acceptance. In the event that the City finally rejects the Equipment, or repudiates acceptance of it, Contractor will refund to the City all fees received with respect to the rejected product, and the City will cease using the Equipment and return the Equipment to the Contractor.

4. **SPECIAL PURCHASING TERMS AND CONDITIONS:** In addition to all other terms and conditions stated in this Agreement, Contractor shall comply with the following special purchasing terms and conditions:

A. Pricing is F.O.B. Denver, CO, delivered to the City facilities as set out in a separate and subsequent writing. Contractor agrees to bear all risk of loss, injury, or destruction of goods and materials ordered as a result of this Agreement which occur prior to delivery to the City; and such loss, injury or destruction shall not release the Contractor from any obligation hereunder.

B. Contractor agrees to bear all risk of loss, injury, or destruction of goods and materials ordered as a result of this Agreement which occur prior to delivery to the City; and such loss, injury or destruction shall not release Contractor from any obligation hereunder. Thereafter, risk of loss shall pass to the City and Bank as further described in the LPA.

C. Contractor agrees to furnish, upon the written request of the City, any additional information needed to substantiate or clarify the design and/or performance characteristics of the Equipment.

D. Contractor Invoices must include the following:

- (1) City contract control number.
- (2) Items listed individually.
- (3) Invoice number and date.
- (4) Requesting department name and "ship to" address.
- (5) Payment terms.

5. **TERM.** The term of this Agreement shall commence upon July 1, 2020, and expire on December 31, 2022.

6. **COMPENSATION.**

A. It is understood and agreed that the City has elected to acquire the Equipment and Warranties through the LPA. The City and Bank through the LPA will provide for payment to the Contractor of the maximum amount stated herein subject to the procedure set out in the LPA. The Contractor's performance under this Agreement is expressly conditioned upon proper payment as set out herein.

B. The total compensation payable to Contractor for acquiring and delivering the Equipment together with the Warranties shall not exceed the amount of **THREE MILLION**

FIVE HUNDRED FIFTY NINE THOUSAND TWENTY FOUR DOLLARS AND NINETY TWO CENTS (\$3,559,024.92) (the “Maximum Purchase Amount”), payable directly to the Contractor by the Bank. In the event that this Agreement is fully executed prior to August 4, 2020 and payment is made to the Contractor, then Contractor shall decrease the Maximum Purchase Amount to **THREE MILLION THREE HUNDRED FORTY THOUSAND EIGHT HUNDRED AND SIXTY-FOUR DOLLARS (\$3,340,864.00)**. Title to the Equipment shall vest with the Bank upon payment of the Maximum Purchase Amount to Contractor or as otherwise agreed to by the parties. Beneficial use of the Equipment and Warranties shall remain with the City.

	Before or on August 3rd	After August 3rd
Purchase Price (3% incr. after 8/3)	\$3,455,364	\$3,559,024.92
Direct Vendor Pay Discount	(\$114,500)	TBD – discount available, but less than \$114,500
Total Purchase Price	\$3,340,864	\$3,559,024.92 less TBD discount

C. The total compensation payable by the City to Contractor under this Agreement for the Equipment and Warranties is Zero Dollars (\$0.00) (the “Maximum Contract Amount”). However, the parties recognize and agree that Contractor will be paid the Purchase Price by payment directly from the Bank.

D. It is understood and agreed that any payment obligation of the City hereunder, whether direct or contingent, shall extend only to funds appropriated by the Denver City Council for the purpose of this Agreement, encumbered for the purpose of the Agreement and paid into the Treasury of the City. Contractor acknowledges that (a) the City does not by this Agreement, irrevocably pledge present cash reserves for payments in future fiscal years, and (b) this Agreement is not intended to create a multiple-fiscal year direct or indirect debt or financial obligation of the City.

7. **TIME IS OF THE ESSENCE**: The parties agree that in the performance of the terms, conditions, and requirements of this Agreement by Contractor, time is of the essence.

8. **STATUS OF CONTRACTOR**: It is understood and agreed by and between the parties that the status of Contractor shall be that of an independent contractor and it is not intended, nor shall it be construed, that Contractor or any employee or subconsultant is an employee, officer, or agent of the City under Chapter 18 of the Denver Revised Municipal Code for purposes of unemployment compensation, workers' compensation, or for any purpose whatsoever.

9. **TERMINATION OF AGREEMENT**: The City may terminate this Agreement at any time on thirty (30) days' notice if Contractor is in breach or default of the Agreement or if the underlying project or activity is canceled; however, Contractor has the right to cure any default within seven days of Contractor receiving notice of default. The City has the right to terminate this Agreement without cause on thirty (30) days written notice, if that cancellation occurs prior to Contractor ordering the equipment. The City may also by written Notice of Default to Contractor terminate the whole or part of this Agreement in the event Contractor or any of its officers or employees are convicted, plead nolo contendere, enter into a formal agreement in which they admit guilt, enter a plea of guilty, or otherwise admit culpability to criminal offenses of bribery, kickbacks, collusive bidding, bid-rigging, antitrust, fraud, undue influence, theft, racketeering, extortion or any

offense of a similar nature, in connection with Contractor's business. Contractor may terminate this Agreement upon ten (10) days prior written notice if (a) the City breaches this Agreement and the breach remains uncured for thirty (30) days after receipt of written notice of the breach, or (b) Bank fails to honor its obligations under the LPA.

10. **WHEN RIGHTS AND REMEDIES NOT WAIVED:** In no event shall any payment by the City hereunder constitute or be construed to be a waiver by the City of any breach of term, covenant, or condition or any default which may then exist on the part of Contractor, and the making of any such payment when any such breach or default shall exist shall not impair or prejudice any right or remedy available to the City with respect to such breach or default; and no assent, expressed or implied, to any breach of any one or more terms, covenants, or conditions of the Agreement shall be construed as a waiver of any succeeding or other breach.

11. **EXAMINATION OF RECORDS:** Any authorized agent of the City, including the City Auditor or his or her representative, upon reasonable notice, has the right to access, and the right to examine, copy and retain copies, at City's election in paper or electronic form, any pertinent books, documents, papers and records related to Contractor's performance pursuant to this Agreement, provision of any goods or services to the City, and any other transactions related to this Agreement. Contractor shall cooperate with City representatives and City representatives shall be granted access, upon reasonable notice, to the foregoing documents and information during reasonable business hours and until the latter of three (3) years after the final payment under the Agreement or expiration of the applicable statute of limitations. When conducting an audit of this Agreement, the City Auditor shall be subject to government auditing standards issued by the United States Government Accountability Office by the Comptroller General of the United States, including with respect to disclosure of information acquired during the course of an audit. No examination of records and audits pursuant to this paragraph shall require Contractor to make disclosures in violation of state or federal privacy laws. Contractor shall at all times comply with D.R.M.C. 20-276.

12. **TAXES, PERMITS AND LICENSES:** Contractor agrees to pay promptly all taxes, excises, license fees and permit fees of whatever nature applicable to its operations, and to take out and keep current all required licenses or permits, whether municipal, state or federal, required for the conduct of its business hereunder, and further agrees not to permit any of said taxes, excises or license or permit fees to become delinquent. Contractor further agrees to furnish the City, upon request, duplicate receipts or other satisfactory evidence showing the prompt payment by Contractor of all required licenses and permits and all taxes. Contractor further agrees to pay promptly when due all bills, debts and obligations incurred by it in connection with its operations, and not to permit the same to become delinquent and to suffer no lien, mortgage, judgment or execution to be filed which will in any way impair the rights of the City under this Agreement.

13. **VENUE, GOVERNING LAW:** Each and every term, condition, or covenant herein is subject to and shall be construed in accordance with the provisions of Colorado law, any applicable federal law, the Charter of the City and County of Denver and the ordinances, regulations, and Executive Orders enacted and/or promulgated pursuant thereto. Such applicable law, together with the Charter, Revised Municipal Code, regulations and Executive Orders of the City and County of Denver, as the same may be amended from time to time, is hereby expressly incorporated into this Agreement as if fully set out herein by this reference. Venue for any action arising hereunder shall be in the Denver County or Denver District Court in the City and County of Denver, Colorado.

14. **USE, POSSESSION OR SALE OF ALCOHOL OR DRUGS:** Contractor, its officers, agents, and employees shall cooperate and comply with the provisions of Executive Order 94 and Attachment A thereto concerning the use, possession or sale of alcohol or drugs. Violation of these provisions or refusal to cooperate with implementation of the policy can result in the City's barring Contractor from City facilities or participating in City operations.

15. **ASSIGNMENT AND SUBCONTRACTING:**

A. Provided that the City shall have accepted the Equipment, the City shall not have the right to and shall not assert against any assignee of Bank or other registered owner of the Equipment any claim, counterclaim or other right the City may have against the Contractor.

B. None of the City's right, title and interest in any portion of the Equipment may be assigned or encumbered by the City for any reason; except that the City may sublease all or part of such Equipment if (a) such sublease is to an agency or department of, or a political subdivision of, the State or (b) the City obtains the prior written consent of Bank and an opinion of nationally recognized counsel in the area of tax exempt municipal obligations satisfactory to Bank that such subleasing will not adversely affect the exclusion of the interest components of the rental payments made to Bank under the lease-purchase transaction referenced herein from gross income for federal income purposes. Any such sublease of all or part of any Equipment shall be subject to the lease-purchase transaction with Bank and the rights of Bank in, to and under such transaction with respect to the Equipment.

C. The City is otherwise not obligated or liable under this Agreement to any party other than the Contractor named herein. Contractor understands and agrees that it shall not assign or subcontract with respect to any of its rights, benefits, obligations or duties under this Agreement except upon prior written consent and approval of the City, which consent or approval may be withheld in the absolute discretion of the City; and in the event any such assignment or subcontracting shall occur, such action shall not be construed to create any contractual relationship between the City and such assignee or subcontractor, and Contractor herein named shall remain fully responsible to the City according to the terms of this Agreement.

16. **NO DISCRIMINATION IN EMPLOYMENT:** In connection with the performance of work under this contract, the Contractor may not refuse to hire, discharge, promote or demote, or discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, gender, age, military status, sexual orientation, gender identity or gender expression, marital status, or physical or mental disability. The Contractor shall insert the foregoing provision in all subcontracts.

17. **INSURANCE:**

A. **General Conditions:** Contractor agrees to secure, at or before the time of execution of this Agreement, the following insurance covering all operations, goods or services provided pursuant to this Agreement. Contractor shall keep the required insurance coverage in force at all times during the term of the Agreement, or any extension thereof, during any warranty period, and for three (3) years after termination of the Agreement. The required insurance shall be underwritten by an insurer licensed or authorized to do business in Colorado and rated by A.M. Best Company as "A-"VIII or better. Each policy shall contain a valid provision or endorsement requiring notification to the City in the event any of the required

policies be canceled or non-renewed before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Agreement. Such notice shall reference the City contract number listed on the signature page of this Agreement. Said notice shall be sent thirty (30) days prior to such cancellation or non-renewal unless due to non-payment of premiums for which notice shall be sent ten (10) days prior. If such written notice is unavailable from the insurer, contractor shall provide written notice of cancellation, non-renewal and any reduction in coverage to the parties identified in the Notices section by certified mail, return receipt requested within three (3) business days of such notice by its insurer(s) and referencing the City's contract number. If any policy is in excess of a deductible or self-insured retention, the City must be notified by the Contractor. Contractor shall be responsible for the payment of any deductible or self-insured retention. The insurance coverages specified in this Agreement are the minimum requirements, and these requirements do not lessen or limit the liability of the Contractor. The Contractor shall maintain, at its own expense, any additional kinds or amounts of insurance that it may deem necessary to cover its obligations and liabilities under this Agreement.

B. Proof of Insurance: Contractor shall provide a copy of this Agreement to its insurance agent or broker. Contractor may not commence services or work relating to the Agreement prior to placement of coverage. Contractor certifies that the certificate of insurance attached as Exhibit B, preferably an ACORD certificate, complies with all insurance requirements of this Agreement. The City requests that the City's contract number be referenced on the Certificate. The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Agreement shall not act as a waiver of Contractor's breach of this Agreement or of any of the City's rights or remedies under this Agreement. The City's Risk Management Office may require additional proof of insurance, including but not limited to policies and endorsements.

C. Additional Insureds: For Commercial General Liability, Auto Liability and Excess Liability/Umbrella, Contractor and subcontractor's insurer(s) shall name the City and County of Denver, its elected and appointed officials, employees and volunteers as additional insured.

D. Waiver of Subrogation: For all coverages, Contractor's insurer shall waive subrogation rights against the City.

E. Subcontractors and Subconsultants: All subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services required by this Agreement) shall be subject to all of the requirements herein and shall procure and maintain the same coverages required of the Contractor. Contractor shall include all such subcontractors as additional insured under its policies (with the exception of Workers' Compensation) or shall ensure that all such subcontractors and subconsultants maintain the required coverages. Contractor agrees to provide proof of insurance for all such subcontractors and subconsultants upon request by the City.

F. Workers' Compensation/Employer's Liability Insurance: Contractor shall maintain the coverage as required by statute for each work location and shall maintain

Employer's Liability insurance with limits of \$100,000 per occurrence for each bodily injury claim, \$100,000 per occurrence for each bodily injury caused by disease claim, and \$500,000 aggregate for all bodily injuries caused by disease claims. Contractor expressly represents to the City, as a material representation upon which the City is relying in entering into this Agreement, that none of the Contractor's officers or employees who may be eligible under any statute or law to reject Workers' Compensation Insurance shall effect such rejection during any part of the term of this Agreement, and that any such rejections previously effected, have been revoked as of the date Contractor executes this Agreement.

G. Commercial General Liability: Contractor shall maintain a Commercial General Liability insurance policy with limits of \$1,000,000 for each occurrence, \$1,000,000 for each personal and advertising injury claim, \$2,000,000 products and completed operations aggregate, and \$2,000,000 policy aggregate.

H. Business Automobile Liability: Contractor shall maintain Business Automobile Liability with limits of \$1,000,000 combined single limit applicable to all owned, hired and non-owned vehicles used in performing services under this Agreement

I. Excess/Umbrella Liability: N/A

J. Additional Provisions:

(a) For Commercial General Liability and Excess Liability, the policies must provide the following:

- (i) That this Agreement is an Insured Contract under the policy;
- (ii) Defense costs are in excess of policy limits;
- (iii) A severability of interests or separation of insureds provision (no insured vs. insured exclusion); and
- (iv) A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City.

(b) For claims-made coverage:

- (i) The retroactive date must be on or before the contract date or the first date when any goods or services were provided to the City, whichever is earlier

(c) Contractor shall advise the City in the event any general aggregate or other aggregate limits are reduced below the required per occurrence limits. At their own expense, and where such general aggregate or other aggregate limits have been reduced below the required per occurrence limit, the Contractor will procure such per occurrence limits and furnish a new certificate of insurance showing such coverage is in force.

K. City's Insurance. The City is self-insured pursuant to the Colorado Governmental Immunity Act, C.R.S. §24-10-101 et seq., and shall not be required to obtain any

liability, fire, casualty or other insurance as a result of this Agreement. Neither shall any contrary statement contained in any attachment or exhibit hereto be construed to shift the risk of loss or liability to the City.

18. **DEFENSE AND INDEMNIFICATION:**

A. Contractor hereby agrees to defend, indemnify, reimburse and hold harmless City, its appointed and elected officials, agents and employees for, from and against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or relating to the work performed under this Agreement ("Claims"), unless such Claims have been specifically determined by the trier of fact to be the primary negligence or willful misconduct of the City. This indemnity shall be interpreted in the broadest possible manner to indemnify City for any acts or omissions of Contractor or its subcontractors either passive or active, irrespective of fault, including City's concurrent negligence whether active or passive, except for the primary negligence or willful misconduct of City.

B. Contractor's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether Claimant has filed suit on the Claim. Contractor's duty to defend and indemnify City shall arise even if City is the only party sued by claimant and/or claimant alleges that City's negligence or willful misconduct was the sole cause of claimant's damages.

C. Contractor will defend any and all Claims which may be brought or threatened against City and will pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this indemnity obligation. Such payments on behalf of City shall be in addition to any other legal remedies available to City and shall not be considered City's exclusive remedy.

D. Insurance coverage requirements specified in this Agreement shall in no way lessen or limit the liability of the Contractor under the terms of this indemnification obligation. The Contractor shall obtain, at its own expense, any additional insurance that it deems necessary for the City's protection.

E. This defense and indemnification obligation shall survive the expiration or termination of this Agreement.

F. In the event of any claim to the City concerning infringement or violation of a third party's intellectual property rights, the City will endeavor to promptly notify Contractor in writing of any such claim and will cooperate with Contractor and its legal counsel in the defense thereof. Contractor may in its discretion (1) contest, (2) settle, (3) procure for the City the right to continue using the Equipment, software, or services, or (4) modify or replace them to be non-infringing (as long as the functionality and performance are not degraded as reasonably determined by the City). The City may participate in the defense of such action at its own expense. If none of the foregoing options is reasonably possible, then Contractor will refund a pro-rata portion of the amounts paid hereunder with respect to the Equipment, software, or services (based on the expected life thereof) and reimburse the City for all reasonable

expenses for removal and replacement of the Equipment or software. Contractor is not liable for any infringement-related liabilities based upon modifications to the Equipment or software made by the City without Contractor's consent or being used or sold with products not provided by Contractor and made without Contractor's consent.

19. **CONFLICT OF INTEREST:** The parties agree that no official, officer or employee of the City shall have any personal or beneficial interest whatsoever in the services or property described herein and Contractor further agrees not to hire or contract for services any official, officer or employee of the City or any other person which would be in violation of the Denver Revised Municipal Code Chapter 2, Article IV, Code of Ethics, or Denver City Charter Sections 1.2.9 and 1.2.12.

20. **NO THIRD-PARTY BENEFICIARY:** It is expressly understood and agreed that enforcement of the terms and conditions of this Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to the City and Contractor, and nothing contained in this Agreement shall give or allow any such claim or right of action by any other or third person or entity on such Agreement, including but not limited to subcontractors and suppliers. It is otherwise the express intention of the City and Contractor that any person or entity other than the City or Contractor receiving services or benefits under this Agreement shall be deemed to be an incidental beneficiary only.

21. **TRADE SECRETS AND CONFIDENTIAL INFORMATION:**

A. Contractor shall not at any time or in any manner, either directly or indirectly, divulge, disclose or communicate to any person, firm or corporation in any manner whatsoever any information concerning any matters related to this Agreement which are not subject to public disclosure, including without limitation the trade secrets of businesses or entities doing business with the City and other privileged or confidential information.

B. In the event that this Agreement or any exhibit or attachment is the subject of an open records request by a third party under Colorado law, the City will notify Contractor of such request. If Contractor believes that any material furnished to the City under this Agreement is not subject to disclosure, it shall take whatever action it deems necessary or appropriate to obtain a court order from the Denver District Court to preclude such disclosure by the City.

22. **DISPUTES:** All disputes of whatsoever nature between the City and Contractor regarding this Agreement shall be resolved by administrative hearings pursuant to the procedure established by Denver Revised Municipal Code §56-106(b) et. seq. For the purposes of that procedure, the City official rendering a final determination shall be the City representative identified in Article 2 hereof.

23. **TAXES, CHARGES AND PENALTIES:** The City shall not pay or be liable for any claimed interest, late charges, fees, taxes or penalties of any nature, except as required by the City's Revised Municipal Code.

24. **PARAGRAPH HEADINGS:** The captions and headings set forth herein are for convenience of reference only and shall not be construed so as to define or limit the terms and provisions hereof.

25. **SEVERABILITY:** It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement, except for the provisions of the Agreement requiring prior

appropriation of funds and limiting the total amount payable by the City, is by the courts held to be illegal or in conflict with any law of the State of Colorado, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provision held to be invalid.

26. **SURVIVAL OF CERTAIN AGREEMENT PROVISIONS:** The parties understand and agree that all terms, conditions and covenants of this Agreement, together with the exhibits and attachments hereto, if any, any or all of which, by reasonable implication, contemplate continued performance or compliance beyond the expiration or termination of this Agreement (by expiration of the term or otherwise), shall survive such expiration or termination and shall continue to be enforceable as provided herein. Without limiting the generality of the foregoing, Contractor's obligations for the provision of insurance, for indemnity to the City and for preserving confidentiality of trade secrets and other information shall survive for a period equal to any and all relevant statutes of limitation, plus the time necessary to fully resolve any claims, matters, or actions begun within that period.

27. **AGREEMENT AS COMPLETE INTEGRATION - AMENDMENTS:** This Agreement, together with the LPA, are intended as the complete integration of all understandings between the parties as to the subject matter of this Agreement. No prior or contemporaneous addition, deletion, or other amendment hereto shall have any force or effect whatsoever, unless embodied herein in writing. No subsequent novation, renewal, addition, deletion, or other amendment hereto shall have any force or effect unless embodied in a written amendatory or other Agreement properly executed by the parties. No oral representation by any officer or employee of the City at variance with the terms and conditions of this Agreement or any written amendment to this Agreement shall have any force or effect or bind the City. Amendments to this Agreement will become effective when approved by both parties and executed in the same manner as this Agreement. This Agreement and any amendments shall be binding upon the parties, their successors and assigns.

28. **LEGAL AUTHORITY:**

A. Contractor assures and guarantees that it possesses the legal authority, pursuant to any proper, appropriate and official motion, resolution or action passed or taken, to enter into this Agreement.

B. The person or persons signing and executing this Agreement on behalf of Contractor, do hereby warrant and guarantee that he/she or they have been fully authorized by Contractor to execute this Agreement on behalf of Contractor and to validly and legally bind Contractor to all the terms, performances and provisions herein set forth.

C. The City shall have the right, at its option, to either temporarily suspend or permanently terminate this Agreement, if there is a dispute as to the legal authority of either Contractor or the person signing the Agreement to enter into this Agreement. The City shall not be obligated to pay Contractor for any performance of the provisions of this Agreement after the City has suspended or terminated this Agreement as provided in this Article.

29. **COUNTERPARTS OF THIS AGREEMENT:** This Agreement shall be executed in two (2) counterparts, each of which shall be deemed to be an original of this Agreement.

30. NO EMPLOYMENT OF ILLEGAL ALIENS TO PERFORM WORK UNDER THE AGREEMENT:

A. This Agreement is subject to Division 5 of Article IV of Chapter 20 of the Denver Revised Municipal Code, and any amendments (the “Certification Ordinance”).

B. The Contractor certifies that:

- (1)** At the time of its execution of this Agreement, it does not knowingly employ or contract with an illegal alien who will perform work under this Agreement.
- (2)** It will participate in the E-Verify Program, as defined in § 8-17.5-101(3.7), C.R.S., to confirm the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement.

C. The Contractor also agrees and represents that:

- (1)** It shall not knowingly employ or contract with an illegal alien to perform work under the Agreement.
- (2)** It shall not enter into a contract with a sub-consultant or subcontractor that fails to certify to the Contractor that it shall not knowingly employ or contract with an illegal alien to perform work under the Agreement.
- (3)** It has confirmed the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement, through participation in either the E-Verify Program.
- (4)** It is prohibited from using either the E-Verify Program procedures to undertake pre-employment screening of job applicants while performing its obligations under the Agreement, and that otherwise requires the Contractor to comply with any and all federal requirements related to use of the E-Verify Program including, by way of example, all program requirements related to employee notification and preservation of employee rights.
- (5)** If it obtains actual knowledge that a sub-consultant or subcontractor performing work under the Agreement knowingly employs or contracts with an illegal alien, it will notify such sub-consultant or subcontractor and the City within three (3) days. The Contractor will also then terminate such sub-consultant or subcontractor if within three (3) days after such notice the sub-consultant or subcontractor does not stop employing or contracting with the illegal alien, unless during such three-day period the sub-consultant or subcontractor provides information to establish that the sub-consultant or subcontractor has not knowingly employed or contracted with an illegal alien.
- (6)** It will comply with any reasonable request made in the course of an investigation by the Colorado Department of Labor and

Employment under authority of § 8-17.5-102(5), C.R.S., or the City Auditor, under authority of D.R.M.C. 20-90.3.

D. The Contractor is liable for any violations as provided in the Certification Ordinance. If Contractor violates any provision of this section or the Certification Ordinance, the City may terminate this Agreement for a breach of the Agreement. If the Agreement is so terminated, the Contractor shall be liable for actual and consequential damages to the City. Any such termination of a contract due to a violation of this section or the Certification Ordinance may also, at the discretion of the City, constitute grounds for disqualifying Contractor from submitting bids or proposals for future contracts with the City.

31. **ELECTRONIC SIGNATURES AND ELECTRONIC RECORDS:** Contractor consents to the use of electronic signatures by the City. The Agreement, and any other documents requiring a signature hereunder, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

32. **NOTICES:** All notices required by the terms of the Agreement must be hand delivered, sent by overnight courier service, mailed by certified mail, return receipt requested, or mailed via United States mail, postage prepaid, if to Contractor at the address first above written, and if to the City at:

Executive Director of Department of Transportation & Infrastructure or Designee
201 West Colfax Avenue, Dept. 608
Denver, Colorado 80202

With a copy of any such notice to:

Denver City Attorney's Office
1437 Bannock St., Room 353
Denver, Colorado 80202

Notices hand delivered or sent by overnight courier are effective upon delivery. Notices sent by certified mail are effective upon receipt. Notices sent by mail are effective upon deposit with the U.S. Postal Service. The parties may designate substitute addresses where or persons to whom notices are to be mailed or delivered. However, these substitutions will not become effective until actual receipt of written notification.

33. **COMPLIANCE WITH ALL LAWS:** Contractor shall perform or cause to be performed all services in full compliance with all applicable laws, rules, regulations and codes of the United States, the State of Colorado; and with the Charter, ordinances, rules, regulations and Executive Orders of the City and County of Denver.

34. **NO CONSTRUCTION AGAINST DRAFTING PARTY:** The parties and their respective counsel have had the opportunity to review the Agreement, and the Agreement will

not be construed against any party merely because any provisions of the Agreement were prepared by a particular party.

35. **ADVERTISING AND PUBLIC DISCLOSURE:** The Contractor shall not include any reference to the Agreement or to services performed pursuant to the Agreement in any of the Contractor's advertising or public relations materials without first obtaining the written approval of the Manager. Any oral presentation or written materials related to services performed under the Agreement will be limited to services that have been accepted by the City. The Contractor shall notify the Manager in advance of the date and time of any presentation. Nothing in this provision precludes the transmittal of any information to City officials.

36. **CITY EXECUTION OF AGREEMENT:** The Agreement will not be effective or binding on the City until it has been fully executed by all required signatories of the City and County of Denver, and if required by Charter, approved by the City Council.

[Signatures on following page]

Contract Control Number:
Contractor Name:

DOTI-202054929-00
FRONT RANGE FIRE APPARATUS, LIMITED

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at
Denver, Colorado as of:

SEAL

CITY AND COUNTY OF DENVER:

ATTEST:

By:

APPROVED AS TO FORM:

Attorney for the City and County of Denver

By: _____

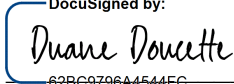
REGISTERED AND COUNTERSIGNED:

By: _____

By: _____

Contract Control Number:
Contractor Name:

DOTI-202054929-00
FRONT RANGE FIRE APPARATUS, LIMITED

By:  DocuSigned by:
Duane Doucette
62BC9796A4644FG...

Name: Duane Doucette
(please print)

Title: President
(please print)

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

EXHIBIT A**EQUIPMENT**

<u>Quantity</u>	<u>Description</u>	<u>Price</u>
1	Pierce Velocity Rescue	\$1,066,467.00
2	Pierce Velocity Pumper	\$1,221,722.00
1	Pierce Velocity Ascendant Ladder	\$1,167,175.00

Specifications of equipment, training, and warranties to be provided by Contractor are set out on the attached pages, which together with this cover sheet constitute **Exhibit A**.

Exhibit A



FRONT RANGE FIRE APPARATUS

7600 Miller Court
Frederick, CO 80504
303-449-9911
1-800-334-9911
www.FrontRangeFire.com

DUANE DOUCETTE
303-304-6118
DuaneD@frontrangefire.com



PERFORM. LIKE NO OTHER.™

FOR FURNISHING FIRE APPARATUSJanuary 01, 2020City and County of Denver

The undersigned is prepared to manufacture for you, upon an order being placed by you, for final acceptance by Front Range Fire Apparatus., at its home office in Frederick, Colorado, the apparatus and equipment herein named and for the following prices:

(1) Pierce Velocity Rescue per attached component list **\$1,066,467.00**
Delivery is approximately 14 to 15 months

Option 1: Make Chassis Pre-Payment of \$464,825.00
Due in Net 30 Days of Signed Contract **Deduct \$13,944.00**

Option 2: Make 100% Prepayment of \$1,021,467.00
Due in Net 30 Days of Signed Contract **Deduct \$45,000.00**

Total \$ _____

Said apparatus and equipment are to be built and shipped in accordance with the specifications hereto attached, delays due to strikes, war, or intentional conflict, failures to obtain chassis, materials, or other causes beyond our control not preventing, within about 14 to 15 months after receipt of this order and the acceptance thereof at our office at Frederick, Colorado, and to be delivered to you Denver, CO

The specifications herein contained shall form a part of the final contract, and are subject to changes desired by the purchaser, provided such alterations are interlined prior to the acceptance by the company of the order to purchase, and provided such alterations do not materially affect the cost of the construction of the apparatus.

The specification for fire apparatus conforms with all Federal Department of Transportation (DOT) rules and regulations in effect at the time of bid, and with all National Fire Protection Association (NFPA) Guidelines for Automotive Fire Apparatus as published at the time of bid, except as modified by customer specifications. Any increased costs incurred by first party because of future changes in or additions to said DOT or NFPA standards will be passed along to the customers as an addition to the price set forth above.

Unless accepted within 30 days from date, the right is reserved to withdraw this proposition.

FRONT RANGE FIRE APPRATUS.

By: _____
 Duane Doucette
 SALES REPRESENTATIVE





Option List

12/11/2019

Customer: Denver Fire Department
Representative Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd
Requirements Manager:
Description: Rescue, Walkin, Velocity
Body: HDR, Walk-In, Aluminum
Chassis: Velocity Chassis (Big Block), 2010

Bid Number: 963
Job Number:
Number of Units: 1
Bid Date: 12/02/2019
Stock Number:
Price Level: 38 (Current: 38)
Lane:

Line	Option	Type	Option Description	Qty
1	0766614		Boiler Plates, Heavy Duty Rescue Fire Department/Customer - Denver Fire Department Operating/In conjunction W-Service Center - Operating Miles - 25 Miles Number of Fire Dept/Municipalities - 10 Bidder/Sales Organization - Front Range Fire Apparatus Delivery - Delivery representative Dealership/Sales Organization, Service - Front Range Fire Apparatus	1
2	0661794		Single Source Compliance	1
3	0584456		Manufacture Location, Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0670275		Unit to be Similar in some Aspects, Excluding Pump Panel Fill in Blank - 20562	1
7	0610784		Comply NFPA 1901 Changes Effective Jan 1, 2016, With Exceptions	1
8	0533352		Special Services (Rescue) Fire Apparatus	1
9	0588614		Vehicle Certification, Rescue	1
10	0681285		Agency, Apparatus Certification, Rescue, U.L.	1
11	0000000	STF	Inspection trip #1 - when - number of people Location - at the customer location for a pre-construction conference. Qty, - 02	2
11	0000000	STF	Inspection trip #2 - when - number of people Location - at the factory for a post paint inspection. Qty, - 02	2
11	0000000	STF	Inspection trip #3 - when - number of people Location - at the factory for a delivery inspection. Qty, - 02	2
12	0092138		Highly Customized Product (HCP)	1
13	0620362		Consortium, HGAC	1
14	0535579		Not Required, Unit of Measure, (no pump, no tank)	1
15	0030006		Bid Bond Not Requested	1
16	0582800		Performance Bond, 100 Percent w/25 Percent Warranty Bond, 1 Yr, and Payment Bond	1
17	0000007		Approval Drawing	1
18	0002928		Electrical Diagrams	1
19	0564202		Velocity Chassis (Big Block), 2010	1
20	0021007		Maximum Overall Height Size - 11' 10"	1
21	0000110		Wheelbase Wheelbase - 272.50"	1
22	0000070		GVW Rating GVW rating - 70,800 LBS	1
23	0000203		Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/DCF	1
24	0756525		Frame Liner, Internal "C" 12.50" x 3.00" x .25", XT/Vel/Imp, Full Length, 56"Qv	1
25	0508849		Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel	1
26	0010427		Suspension, Front TAK-4, 22,800 lb, Qtm/AXT/Imp/Vel/DCF/Enf	1
27	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	1
28	0000322		Oil Seals, Front Axle	1
29	0594821		Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply	1
30	0019611		Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot	1
31	0508439		Axle, Rear, Meritor RT46-160, 48,000 lb, HDR/Tiller Tractor	1
32	0544244		Top Speed of Vehicle, 60 MPH	1

Line	Option	Type	Option Description	Qty
33	0581285		Suspen, Rear, Hendrickson FMX 482 EX, Air Ride, 48,000 lb, HDR	1
34	0000485		Oil Seals, Rear Axle	1
35	0629346		Valves, Dump, Air Ride, Rear Axle, Park Brake Interlock	1
			Switch, Dump Valve - Cab	
36	0587016		Tires, Rear, Goodyear, G622 RSD, 12R22.50, 16 ply, Tandem	1
37	0019639		Wheels, Rear, Alcoa, 22.50" x 8.25", Aluminum, Hub Pilot, Tandem	1
38	0642999		Tire Balancing, Nothing Required	1
39	0602747		No Tire Pressure Indicator, Fire Department Omits, Non-NFPA 2016 Compliant	1
40	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1
41	0013241		Axle Hub Covers, Rear, S/S High Hat (Tandem)	1
42	0097571		Mud Flaps, Mounted even with Fenderetts	1
			Location - front	
			Qty, - 1	
43	0002045		Mud Flaps, w/logo front & rear	1
44	0640104	SP	Label, Informational, Crossfire System, 85 PSI	1
45	0021931		Tire, "Crossfire" Air Pressure Equalization (tandem)	1
46	0031931		Valve, Extension Stabilizer System, Rear Duals	1
47	0544802		Chocks, Wheel, SAC-44-E, Folding	1
			Qty, Pair - 01	
48	0544806		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal	1
			Qty, Pair - 01	
			Location, Wheel Chocks - Right Side Rear Compt	
49	0593759		ESC/ABS/ATC Wabco Brake System, Tandem Rear Axle, 2010	1
50	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
51	0000730		Brakes, Meritor, Cam, Rear, 16.50 x 7.00"	1
52	0020784		Air Compressor, Brake, Cummins/Wabco 18.7 CFM	1
53	0000789		Brake Reservoirs, Five	1
54	0587033		Air Dryer, Brake, AD-9 w/heat, 2010	1
55	0000790		Brake Lines, Nylon	1
56	0000854		Air Inlet, w/Disconnect Coupling	1
			Location, Air Coupling(s) - a) DS Step Well, Rearward	
			Qty, Air Coupling (s) - 1	
57	0000860		Outlet, Air, with shut off valve	1
			Location, Air Coupling(s) - o) DS Frt Body Compt	
			Qty, Air Coupling (s) - 1	
58	0004200		Hose, Air 25' length, w/air chuck	2
			Qty, - 02	
59	0522855		Aux Braking Systems, Simultaneous Operation	1
60	0515061		Paint, Chassis Air tanks, Job Color	1
			Location - xxx	
61	0612549		Fittings, Compression Type, Entire Apparatus, Tandem Rear Axle	1
62	0764546		Engine, Cummins X12, 500 hp, 1695 lb-ft, W/OBD, EPA 2018, Velocity	1
63	0001244		High Idle w/Electronic Engine, Custom	1
64	0678027		Engine Brake, Jacobs Compression Brake, Cummins Engine, with Allison Retarder	1
			Switch, Engine Brake - e) ISC/ISM/ISL9/ISX Hi Med Lo	
65	0607623	SP	Clutch, Fan, Air Actuated, Horton Drive Master, Compression Fitting	1
66	0123135		Air Intake, w/Ember separator, Imp/Vel	1
67	0794743		Exhaust System, 5", X12/X15 Engine, Horizontal, Right Side	1
68	0688512	SP	Exhaust, 35 Degree w/modified end for extraction system, Approval Req'd	1
69	0787999		Radiator, Impel/Velocity	1
70	0612334	SP	Cooling Hoses, Gates Silicone, To include .25" Surge Tank	1
71	0014124		Skid Plate, Radiator, All Custom Chassis	1
72	0673756		Winter Cover With Ventilation, Front Cab Grille, One Piece, Vel	1
			Color, Vinyl Cover - d) White	
73	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1
74	0001129		Lines, Fuel	1
75	0595087		DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	1
			Door, Material & Finish, DEF Tank - Polished Stainless	
76	0552777		Fuel Pump for Repriming	1
77	0582243		Shutoff Valves, Fuel Line @ Primary Filter, Cummins	1
78	0553019		Cooler, Engine Fuel, Imp/Vel, AXT/Qtm/Sab/DCF/SFR/Enf	1
79	0578959		Fuel/Water Separator, Racor Inline	1

Line	Option	Type	Option Description	Qty
80	0642591		Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Dash CF	1
			Trans. retarder capacity - e. medium/1600, 4000 EVS	
			Trans, retarder control - I) Auto 1/3, 2/3, 3/3	
81	0625331		Transmission, Shifter, 6-Spd, Push Button, 4000 EVS	1
82	0797408		Transmission Oil Cooler, Modine, External, w/Modine External Sump	1
83	0539711		Label, TRANSynd Transmission Fluid Only	1
84	0522824		Mode, Downshift, Aggressive downshift to 3rd, w/engine brake, 6 speed	1
85	0565656		Fluid, 4000/4500 Series Transmission, TranSynd synthetic, IPOS, Custom	1
86	0001375		Driveline, Spicer 1810	1
87	0669988		Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	1
88	0001544		Not Required, Steering Assist Cylinder on Front Axle	1
89	0509230		Steering Wheel, 4 Spoke without Controls	1
90	0690274		Logo/Emblem, on Dash	1
			Text, Row (1) One - Denver	
			Text, Row (2) Two - Fire	
			Text, Row (3) Three - Department	
91	0034671		Lube System, Vogel, 22 Point, w/TAK-4 Suspension	1
			Location - LS5 back wall high forward corner	
92	0762547	SP	Winch, Warn, 15000 lb. Fixed, Rear, Series 15-S Spydura Pro, Electric	1
			Stay arm, Tray Cover - c)Pneumatic Stay Arm, Dual	
93	0632347	SP	Winch, Warn, 15000 lb. Fixed, Front, Series 15-S Spydura Pro, Electric	1
			Stay arm, Tray Cover - c)Pneumatic Stay Arm, Dual	
94	0123625		Bumper, 19" Extended, Imp/Vel	1
95	0638048		Box, Tool w/cover, Right	1
			Stay arm, Tray Cover - b) Pneumatic Stay Arm	
			Latch, Bumper Storage - lift and turn latch	
96	0625556		Hose Restraint, Not Required, Cover Included with Other Option	1
97	0510226		Lift & Tow Package, Imp/Vel, AXT, Dash CF	1
98	0049963		Tow Eyes, Painted Black, Below Deck	1
99	0762668	SP	Cab, Velocity FR, 7020 Raised Roof, Rear Wall Walk Through, Raised Dr	1
100	0667982		Engine Tunnel, ISX, Impel/Velosity FR	1
101	0677478		Rear Wall, Exterior, Cab, Aluminum Treadplate	1
102	0122466		Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	1
103	0123176		Grille, Bright Finished, Front of Cab, Impel/Velosity	1
104	0002224		Scuffplates, S/S At Cab Door Jambs, 4-Door Cab	1
			Material Trim/Scuffplate - c) S/S, Polished	
105	0527032		Trim, S/S Band, Across Cab Face, Rect Lights, Velocity	1
			Material Trim/Scuffplate - b) S/S, Brushed	
			Turnsignal Covers - No Covers	
106	0087357		Molding, Chrome on Side of Cab	1
107	0559130		Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven	1
			Finish, Arm Cover - Chrome	
			Finish, Mirror Head - Chrome	
108	0667937		Door, Full Height, Velocity FR 4-Door Cab, Raised Roof	1
			Key Model, Cab Doors - 1041	
109	0655511		Door Panel, Brushed Stainless Steel, Impel/Velosity 4-Door Cab	1
110	0667905		Storage Pockets w/ Elastic Cover, Recessed, Impel/Velosity FR	1
111	0667902		Controls, Electric Windows, All Cab Doors, Impel/Velosity FR	1
112	0555485		Steps, 4-Door Full Tilt Cab, Imp/Vel	1
113	0770194		Handrail, Exterior, Knurled, Alum, 4-Door Cab	1
114	0509649		Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per Step	1
115	0002140		Fenders, S/S on Cab	1
116	0122479		Window, Side of C/C, Fixed, Velocity	1
117	0552935		Trim, Cab Side Windows, Velocity	1
118	0652594		Windows, (2), Front of Crew Cab, 20" Raised Roof, Impel/Velosity FR	1
119	0530327		Window, Rear Side of CC, Upper, Fixed, 20" Raised Roof	1
120	0509286		Not Required, Windows Rear of Crew Cab, Imp/Vel	1
121	0558334		Not Required, Trim, Cab Rear Windows, No Rear Windows	1
122	0786302		Window Tint, Front of Raised Roof, Privacy Dark Gray	1
123	0764717		Compt, Storage, 10.71 W x 30 H x 14 D, (1) Ea Side C/C, Dbl Pan, Imp/Vel	1
			Light, Aux Cab Compartments - On Scene Night Axe, Hinged Side	
			Finish, Exterior Cab Compt - Spatter Gray	

Line	Option	Type	Option Description	Qty
123			Door, Cab Exterior Cabinet - Double Pan, (2), Non-Locking	
			Door, Exterior Stop - 2-Web Strap	
124	0643295		Shelf, Equipment Mounting, Aluminum, Lip, Full Width, Qty Feature	1
			Location - across the front of crew cab raised roof area, bottom of shelf should be even with flat roof	
			Qty, - 01	
			Material Finish, Cab Interior - Painted	
			Lip - 1.50"	
125	0748671		Cab Interior, Vinyl, Velocity FR, CARE	1
			Color, Cab Interior Vinyl/Fabric - Endure Vinyl - Silver/Gray	
126	0667943		Cab Interior, Paint Color, Impel/Veloccity FR	1
			Color, Cab Interior Paint - a) gray	
127	0509532		Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	1
128	0667936		Heater/defroster, Dual Zone Control, Impel/Veloccity FR	1
129	0774759	SP	Air Conditioning, Dual Zone Control, Hinge Acc Pnl, Sp Cond, Imp/Vel FR	1
			Paint Color, A/C Condenser - Painted by OEM	
130	0639675		Sun Visor, Smoked Lexan, AXT, Dash CF, Imp/Vel, Saber FR/Enforcer	1
			Sun Visor Retention - No Retention	
131	0548173		Grab Handles, Driver and Passenger Door Post, Imp/Vel	1
132	0002526		Light, Engine Compt, All Custom Chassis	1
133	0122516		Fluid Check Access, Imp/Vel	1
134	0583042		Side Roll and Frontal Impact Protection	1
135	0699999		Not Required, Frontal Impact Protection, 2010	1
136	0622617		Seating Capacity, 6 Seats	1
137	0697005		Seat, Driver, Pierce PS6, Premium, Air Ride, High Back, Safety	1
138	0696994		Seat, Officer, Pierce PS6, Premium, Air Ride, SCBA, Safety	1
139	0656795		Radio Compartment, Behind Officer Air Ride SCBA Seat, Imp/Vel	1
140	0122183		Seat, Rear Facing C/C, DS Outboard, Pierce PS6, Premium, SCBA, Safety	1
141	0102783		Not Required, Seat, Rr Facing C/C, Center	1
142	0122186		Seat, Rear Facing C/C, PS Outboard, Pierce PS6, Premium, SCBA, Safety	1
143	0646213		Seat, Forward Facing C/C, DS Outboard, Pierce PS6, SCBA, Foldup, 17" Btm, Safety	1
144	0103319		Not Required, Seat, Forward Facing C/C, Center	1
145	0642535		Seat, Forward Facing C/C, PS Outboard, Pierce PS6, SCBA, Foldup, 17" Btm, Safety	1
146	0511300		Upholstery, Seats In Cab, All Imperial 1200, Pierce PS6	1
			Color, Cab Interior Vinyl/Fabric - h) Gray/Black	
147	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats	5
			Qty, - 05	
148	0603867		Seat Belt, ReadyReach	1
			Seat Belt Color - Red	
149	0604867		Seat Belt Height Adjustment, 4 Seats, Imp/Vel, Dash CF	1
150	0602464		Helmet Storage, Provided by Fire Department, NFPA 2016	1
151	0647647		Lights, Dome, FRP Dual LED 4 Lts	1
			Color, Dome Lt - Red & White	
			Color, Dome Lt Bzl - Black	
			Control, Dome Lt White - Door Switches and Lens Switch	
			Control, Dome Lt Color - Lens Switch	
152	0631776		Not Required, Overhead Map Lights	1
153	0650352		Spotlight, Golight Stryker, Model 30**4, LED, 2 Lts	1
			Location - one each side of cab	
			Color, GoLt - White	
			Bracket, Spotlight - Pedestal - 2 Lts	
154	0650059		Controller, Spotlight, Golight Stryker, Wired Dash Mount, 2 Lts	1
155	0621826		Location, Spotlight Controller, Driver Overhead and Officer Overhead, 2 Lts	1
155	0000000	STF	Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v, Orange	1
			Location, Portable Hand Light - shipped loose	
156	0544516		Spotlight, Handheld Cab, Specialty Lighting 2150-1	1
			Location, Fixed Hand Light - Officer Side Cab	
157	0568369		Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Veloccity 2010, Dash CF	1
158	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	1
159	0543751		Light, Do Not Move Apparatus	1
			Alarm, Do Not Move Truck - Pulsing Alarm	

Line	Option	Type	Option Description	Qty
160	0509042		Messages, Open Door/Do Not Move Truck, MUX w/Color Display	1
161	0752356	SP	MODIFICATION, Switch Panel Locations	1
162	0611681		Switching, Cab, Membrane, Impel/Velocity/Quantum, Dash CF, AXT WiFi MUX Location, Emerg Sw Pnl's - Driver's Side Overhead	1
163	0555915		Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocity	1
164	0548004		Wiring, Spare, 15 A 12V DC 1st Qty, - 02 12vdc power from - Battery direct Wire termination - Butt Splice Location, Spare Wiring - Officer Dash	2
165	0548006		Wiring, Spare, 15 A 12V DC 2nd Qty, - 01 12vdc power from - Battery direct Wire termination - 15 amp power point plug Location - on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge recessed, as near the top edge of dog house as practical with an enclosure on the inside of engine tunnel for protection - see photo.	1
166	0566101		Recess, Dash Panel, Officer Side, Vel/Imp	1
167	0615386		Vehicle Information Center, 7" Color Display, Touchscreen, MUX System Of Measurement - US Customary	1
168	0606251		Vehicle Data Recorder w/Seat Belt Monitor, Body Seating	1
169	0690003		Wiring Only, Speaker, With Location and Quantity Features Location - EACH FROM THE POWER DISTRIBUTION BOX Qty, - 02 Location 2 - ONE (1) ROUTED TO THE CEILING IN THE FORWARD WALK-IN BODY AREA AND ONE (1) ROUTED TO THE CEILING IN THE REAR WALK-IN BODY AREA	2
170	0003757		Antenna, Std and Add'l Mts Only, 2-way Radio,Cust,Spl Cable Routing Location - DS antenna cable terminated in the officer's kick panel under dash with a 5' loop and all other cables routed to the routed to officer seat box Qty, - 04 Location 1 - on each front corner of raised roof and one in each far corner of the crew cab roof	4
171	0653526		Camera, Pierce, Driver Mux, Rear Camera Only Camera System Audio - Not Provided	1
172	0615100		Pierce Command Zone, Advanced Electronics & Control System, Diag LEDs, Vel, WiFi	1
173	0624254		Electrical System, Velocity	1
174	0080379		Batteries, (4) Exide Grp 31, 750 CCA ea, Threaded Stud	1
175	0008621		Battery System, Single Start, All Custom Chassis	1
176	0123174		Battery Compartment, Imp/Vel	1
177	0579436		Charger, Sngl Sys, Kussmaul, 1200, 091-187-12-Remote, 40 Amp Bar Display	1
178	0744270	SP	Location, Charger, Front Right Side Body Cmpprt Location, Battery Chrgr/Cmpr - Right Wall, High	1
179	0531403		Location, Bat Chrg Ind, Driver's Seat with Bracket	1
180	0016857		Shoreline, 20A 120V, Kussmaul Auto Eject, 091-55-20-120, Super Qty, - 01 Color, Kussmaul Cover - d) yellow Shoreline Connection - yellow	1
181	0026800		Shoreline Location Location, Shoreline(s) - DS Rear bulkhead	1
182	0009429		Electric Power Only, Portable Winch Location - ONE (1) EACH SIDE BODY FENDER PANEL Qty, Receptacles - 02	2
183	0566294		Alternator, 430 amp, Niehoff C680-1	1
184	0695819		Sealer (Gorp), No Gorp Req'd on Elect Connections Execpt Fuel Sender	1
185	0603291	SP	Open Weather Pack Connections Plugged W/Weather Pack Connectors	1
186	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - e)High Idle enable	1
187	0648716		Headlights, Rectangular Halogen, Imp/Vel	1

Line	Option	Type	Option Description	Qty
188	0648425		Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF Color, Lens, LED's - m)match LED's	1
189	0750542		Light, Directional/Marker, Intermediate, Truck-Lite 60421Y LED 2lts	1
190	0648074		Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	1
191	0090155		Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	1
192	0551870		Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir w/Flange Color, Lens - Colored	1
193	0551758		Lights, Backup, WIn M6BUW, LED, Flange Feature Flange Kit - w)with flange	1
194	0663884		Bracket, License Plate & Light, P25 LED, Temp Under Tailbrd Location - left side under tailboard	1
195	0589905		Alarm, Back-up Warning, PRECO 1040	1
196	0763690		Indicator, Back-up Warning, Ultrasonic 4-zone Location - next to driver	1
197	0763032	SP	Fans, Compressor Air Transfer, 230V, 1100 CFM Each Location - D1 rear wall adjacent to breathing air compressor	1
198	0695735		Lights, Perimeter Cab, Truck-Lite 44310C LED Cab, Perimeter Scene - Cab, 4dr Custom	1
199	0616293		Not Required, Lights Perimeter Pump House, No Pump	1
200	0695719		Lights, Perimeter Body, Truck-Lite 44310C LED 2lts, Rear Step Control, Perimeter Lts - DS Switch Panel and Parking Brake Applied	1
201	0629729		Control, Perimeter Lts - DS Switch Panel and Parking Brake Applied Lights, Perimeter, Truck-Lite 44310C LED Grommet Mnt Location, Lights - centered under D1 and P1 Qty, - 02	2
202	0657113		Lights, Step, P25 LED, HDR Walk-In, No Rear Entrance, 2lts, Rear Sw	1
203	0004961		Not Required, Work Lights, Alt. Rear Lights, HDR/Encore, No Hose Bed	1
204	0645685		Lights, Rear Scene, WIn, M6ZC LED, M6P15C 15 Deg Brkt, 42" - 54" High Control, Rear Scene Lts - Cab Switch Panel DS	1
205	0709438		Light, Walking Surf, FRP Flood, LED	1
206	0776357		Light, Visor, WIn, 12V P*H2* Pioneer, Cnt Feature, 1st Qty, - 01 Location, driver's/passenger's/center - Centered Color, WIn Lt Housing - White Paint Control, Scene Lts - Cab Sw Panel DS, Cab Sw Panel PS and LOCATE THE DS AND PS SWITCH IN THE SAME PANEL AS THE GO-LIGHT. VISOR CONTROL FAR LEFT SIDE AND GO LIGHT CONTROL FAR RIGHT SIDE SEE PHOTOS Scene Light Optics - Flood/Spot	1
207	0559733		Buzzer, Two-way, Cab to Body, NOT REQUIRED	1
208	0026117		HDR, Walk-In, Aluminum	1
209	0759082	SP	25.75' Body Length, 24.48.48.Tandem.60, WI	1
210	0632264		100" Body Width, WI	1
211	0026143		78" Interior Height, 103.25" Body Height, WI	1
212	0026147		WI, 103.25"H, Flat Roof	1
213	0594265		Doors, Amdor, Roll-up, Side Compartments Qty, Door Accessory - 12 Color, Roll-up Door - AMDOR Satin Aluminum Latch, Roll-up Door - Non-Locking Liftbar	12
214	0759078	SP	25.75', Body Roll Doors, 24.48.48.Tandem.60, WI	1
215	0759077	SP	Left Forward Compt, 24" & 48" & 48" Roll, WI	1
216	0515810		Left Over Wheel Compt, 51.50"-51.50", Roll Door, Tandem, WI	1
217	0026105		Left Rear Compt, 60" Roll, WI	1
218	0763549	SP	Right Forward Compt, 38" & 56" & 26", Roll, WI	1
219	0515814		Right Over Wheel Compt, 51.50"-51.50", Roll Door, Tandem, WI	1
220	0026109		Right Rear Compartment, 60" Roll, WI	1
221	0026154		Entrance, Rear, 78" Interior Height, WI	1
222	0797082		Interior, Walk-In Body, Floor, Walls, Ceiling, Countertop Material, Interior Lower Wall - Brushed Aluminum Material, Interior Upper Wall - Brushed Aluminum Material, Interior Ceiling - Gray Laminate Material, Interior Countertop - Gray Laminate Material, Interior Flooring - Aluminum Treadplate	1

Line	Option	Type	Option Description	Qty
223	0038669	SP	MODIFICATION, HDR-WI Interior Counter, Partitions, & Shelves 30" Deep.	1
224	0533299	SP	MODIFICATION, Blister Interior Walkway for Generator	1
225	0763028	SP	MODIFICATION, HDR-WI Interior Counter and Lower Walls, 1.00" Insulation	1
226	0038670	SP	Intermediate Step w/Winch Compt, HDR-WI, 16" Run	1
227	0643541		Lights, Interior, 12 VDC, Durolumen R03852 V4, White/Red LED	5
			Qty, - 05	
228	0598207		Switch, Ceiling Lights, 12v Durolumen Red/White Lts, Dual Sw, Dr Wht 3-Way	1
			Location - pass through door area	
			Location 2 - Rear door entrance	
229	0763871		Seat, Bench, Side Facing, Fold-Down, w/o Storage	1
			Location - location DS walkway wall forward	
			Color, Seat Upholstery - j) Gray/Black Imperial 1200	
			Qty, Seats, Bench, Fold Down (No Storage Encl) - 01	
230	0784532	SP	Bracket, Half Round, Use for Hanging Cord, Rope or Hose	6
			Location - along the interior wall on the right under the counter top with the first one	
			6.00" from the counter top recess with 9.42" spacing from edge to edge, 10" wide by 4.5" deep	
			Qty, - 06	
231	0534537		Cabinet, Interior, Upper Wall, Aluminum, Heavy Nylon Web Door, Up To 30" Wide	1
			Location - see print 20562AD -sh2	
			JOB # 20562	
			DS front to back #1	
			Qty, - 1	
			Finish, Interior Cabinet - Brushed Aluminum	
232	0534542		Cabinet, Interior, Upper Wall, Aluminum, Heavy Nylon Web Door, Up To 72" Wide	1
			Location - DS CABINET FRONT TO BACK #7	
			Qty, - 1	
			Finish, Interior Cabinet - Brushed Aluminum	
233	0534540		Cabinet, Interior, Upper Wall, Aluminum, Heavy Nylon Web Door, Up To 60" Wide	1
			Location - PS FRONT TO BACK CABINET #6	
			Qty, - 1	
			Finish, Interior Cabinet - Brushed Aluminum	
234	0534871		Cabinet, Interior, Upper Wall, Aluminum, Heavy Nylon Web Door, Up To 48" Wide	10
			Location - PS FRONT TO BACK CABINET #1, 2, 3, 4 & 5. DS FRONT TO BACK CABINET #2, 3, 4, 5 & 6	
			Qty, - 10	
			Finish, Interior Cabinet - Brushed Aluminum	
235	0753672	SP	MODIFICATION, Compt, Storage, Recessed in Side Wall, Open Front, Rearmost	1
236	0762490	SP	Compt, Storage, Recessed in Side Wall, Open Front	3
			Location - driver side interior	
			Qty, - 03	
			Size - DS WALL OF WALK-IN BODY. ONE (1) BELOW THE FIFTH, SIXTH AND SEVENTH CABINET FROM THE FRONT. EACH TO MATCH THE WIDTH OF THE CABINET DIRECTLY ABOVE.	
237	0779814		Enclosure, Reel Over Countertop	4
			Qty, - 04	
			Material, Interior Component - Aluminum Treadplate	
238	0004416		Handrail On Ceiling	1
			Location - Location will be the full length of the ceiling on the left	
			Qty, - 01	
239	0045063		Escape Hatch, Skylight	1
			Location - Location will be center in the body roof	
			Qty, - 1	
240	0523391		Divider, Vertical, Interior, Fixed	1
			Location - ONE (1) WITHIN THE DS FRONT TO BACK CABINET #7	
			Qty, - 01	
			Material, Interior Component - Brushed Aluminum	
241	0763464	SP	Recess, Counter Top Below Cabinet, Interior	1
			Location - below second from rear passenger side interior cabinet 9.00" MINIMUM PER CUSTOMER SIGNED DRAWING	
			Qty, - 1	

Line	Option	Type	Option Description	Qty
242	0697112	SP	Shelf, Adjustable, Low/Special Side Height, 1" Front, Interior Cabinet Location - Interior compartments PS front to back ONE (1) IN P1,P2,P3,P4,P6. DS front to back ONE (1) IN D1,D3,D5,D6,D7 AND TWO (2) IN D4 Qty, - 12	12
243	0757747	SP	Shelf, Adjustable, Interior, 40" W x 22" D w/Notches Location - in the interior body compartment second from rear passenger side interior cabinet. The shelf will be mounted as far inward as possible - See marked up drawing in E folder Qty, - 1	1
244	0503432		Audio/Video Network Not Provided	1
245	0757453	SP	Stainless Steel, Two Piece, Rear Edge of Roof Material Trim/Scuffplate - b) S/S, Brushed	1
246	0045069		Bumper, Rear Walk-In 13.00" D	1
247	0536087	SP	Compt, Roof, Bolt On, w/Hinged Cover, Alum Tread Location - TWO (2) ON THE DS, ONE (1) ON THE PS of BODY ROOF and one transverse forward for the two rear hatch compartments Qty, - 04 Fill in Blank - TWO (2) ON THE DS 26" W x 9.00" D x LENGTH PER AD, ONE (1) ON PS 26" W x 9" D x LENGTH PER AD AND ONE (1) FORWARD TRANSVERSE x 50" x 9" D	4
248	0029452	SP	Door, Slide-up, Adjacent to Entrance Dr.(Intake Cooling Air for Compressor)	1
249	0038999	SP	Enclosure, Light Mast, Roof Mtd, Treadplate, Three Sides, Extra Long	1
250	0099429		Hitch, Receiver, Sides, Through Fenders, Between Tandems	1
251	0033977		Ladder, Access, Zico Quic-Ladder, Model RL-2-6 Location, driver's/passenger's/center - Right Side	1
252	0762531	SP	Recessed Hydra-Qube, Roof of Walk-In Body Location - FRONT DRIVERS SIDE BODY ROOF. NOT TO INTRUDE ON THE INTERIOR CEILING Qty, - 01	1
253	0027739		Divider, Compt, Vertical, "L" Shaped Location - D1 FORWARD OF DIVIDER Qty, - 1	1
254	0687767		Compt, Under Body, 8" H, Up to 60" W, LS, HDR, Custom Location - ahead of rear wheels Qty, - 02	2
255	0774186		Compt, Under Body, w/Slide Drawer, 8" H, Up to 48" W, RS, Cummins L9/X15/X12 Location - ahead of rear wheels Qty, - 02	2
256	0762178	SP	Rack, Equipment Storage Bins, Denver Location - in the driver side interior compartment second back from the front. Configuration - per drawing provide, copy in the job folder Please provide an option for a 12 bin rack for the departments dive equipment per attached drawing. This rack will be located in the driver side interior compartment second back from the front.	1
257	0523428		Rack, Air Bags, Horizontal Slot(s) Location - AIR BAG RACK DWG. JOB E-FOLDER STAGE 3 "PIERCE DESIGN AIR BAG RACK" DOTTED LINE REPRESENTS 2 BAGS IN SAME SLOT Qty, - 08 Dimensions - AIR BAG RACK DWG. JOB E-FOLDER STAGE 3 "PIERCE DESIGN AIR BAG RACK" DOTTED LINE REPRESENTS 2 BAGS IN SAME SLOT	8
258	0594312	SP	Roller, Additional, Vertical Location - D5 rearward edge of door opening and P6 forward edge of door opening Qty, - 02	2
259	0793822		Not Required, Water Tank, Rescue	1
260	0023410		Not Required, Overflow	1
261	0028107		Not Required, Foam Cell Modification	1
262	0553847		Not Required, Restraint, No Water Tank, Aerial/Rescue w/ Water Tank, Export	1
263	0013534		Not Required, Running Boards	1
264	0690026		Wall, Rear, Body Material	1
265	0003540		Tow Eyes (2) (Tanker/Rescue)	1

Line	Option	Type	Option Description	Qty
266	0552955		Blister, Compts in Front of Rear Axle, To Clear Firemaax Suspension	1
267	0545112		Lights, Compt, On Scene LED, Dual Light Strips, Each Side of Door, HDR	12
			Location - all body compartments	
			Qty, - 12	
268	0784129		Lights, Bolt On Hatch Compt, Pierce LED Strip Lights, HDR	4
			Qty, - 04	
269	0652247		Shelf, Adjustable, 500 lb Capacity, Standard Depth, HDR	9
			Qty, Shelf - 09	
			Location, Shelf - D5-2, D4-1, ONE IN D1-1 REARWARD OF DIVIDER, P6-1, P5-2 and P4-2	
270	0609993	SP	Shelf, Adjustable, 500 lb Capacity, Special Size, Max Standard Depth, HDR	2
			Qty, Shelf - 02	
			Location, Shelf - D4 top shelf and P6 top shelf	
			Dimensions - D4 half the depth of compartment and P6 7.00" reduced depth	
271	0652281		Tray, 500 lb Slide-Out, 2" Sides - Adj. Height, Standard Depth Compt, HDR	1
			Location - D4 just above frame height	
			Qty, Tray (slide-out) - 01	
272	0652263		Tray, 200 lb, Tilt/Slide-out, 30 Deg, Adj, Standard Depth compt, HDR	3
			Location - D2, D3 and P2	
			Qty, Tray (slide-out) - 03	
273	0763029	SP	Tray, Floor Mounted, Slide-Out, Std Depth, 1000 lb, .25" Flat Top, SlideMaster	1
			Qty, - 01	
			location - D1 under breathing air compressor	
274	0539177		Rub Rail, Aluminum Extruded, Side and Rear Body, Xtra Space (.50")	1
275	0004027		Fender Crowns, Rear, S/S, Two Pair	1
276	0519848		Not Required, Hose, Hard Suction, No Pump	1
277	0004210		Compt, Air Bottle in Fender Panel	7
			Location, Bracket/comp. - FOUR (4) ON THE PS AND THREE (3) BETWEEN THE TANDEM REARWARD ON THE DRIVERS SIDE. ALL TO BE 27" DEEP	
			Qty, Air Bottle Comp - 7	
278	0795737		Compt, Air Bottle, Corner of Fender Panel, Single, Common DEF Fill Door, HDR	1
			Door Finish, Fender Compt - Polished	
			Latch, Air Bottle Compt - Flush Lift & Turn	
			Insert, Air Bottle Compt - Rubber Matting	
279	0044229		No Extension Ladder Req'd	1
280	0074231		No Roof Ladder Req'd	1
281	0654577		Ladder, 14' Duo-Safety 775A Roof, 16.00" Width, Non-NFPA Compliant	1
			Qty, - 01	
			Location - shipped loose	
282	0074248		Not Required, Folding Ladder	1
283	0540739		Not Required, Rack, Equipment Storage, Rear Compt	1
284	0621559		Step, Rear, Swing Down, Gas Assist Cylinders w/Morton Cass Insert, HDR, MUX	1
285	0796159		Not Required, Pump, Rescue	1
286	0012216		No Seal/Packing Required	1
287	0012690		Not Required, Trans, Pump	1
288	0669703		Not Required, Pumping Mode	1
289	0024484		Not Required, Pump Shift	1
290	0046295		Transmission Lock-up, Not Req'd, NO PUMP	1
291	0046296		Not Required, Auxiliary Cooling System, NO PUMP	1
292	0046283		Not Required, Transfer Valve, NO PUMP	1
293	0024513		Not Required, Intake Relief Valve	1
294	0046403		No Relief Valve Req'd, No Pump	1
295	0012336		No Pump Primer Req'd	1
296	0012816		Not Required, Pump Manuals	1
297	0090789		Not Required, Plumbing, No Pump	1
298	0046371		Not Required, No Plumbing or Foam System	1
299	0796254		No Main Inlet Required, Rescue No Pump	1
300	0584002		Not Required, Cap, Main Pump Inlet, No Side Inlet Caps Required, No Pump	1
301	0089389		No Valves, (No Pump)	1
302	0055600		Not Required, Auxiliary Inlet, Left Side	1
303	0029147		Not Required, Inlet, Right Side	1

Line	Option	Type	Option Description	Qty
304	0074685		Not Required, Inlet Installation	1
305	0064700		Not Required, Inlet Control	1
306	0681723		No Bleeder Valve, No Pump	1
307	0681730		Not Required, Tank to Pump, No Pump	1
308	0074900		Not Required, Tank Fill	1
309	0551181		Not Required, Outlet, Left Side, Rescue	1
310	0092570		Not Required, Outlets, Left Side Additional	1
311	0021143		Not Required, Outlet, Right Side	1
312	0092571		Not Required, Outlets, Right Side Additional	1
313	0545326		Not Required, Outlet, Large Diameter, No Pump	1
314	0092572		Not Required, Outlet, Front	1
315	0551179		Not Required, Discharge Caps	1
316	0089391		Valve, Bleeder - None Req'd, (No Pump)	1
317	0055095		Not Required, Elbow, Left Side Outlets, 2.50"	1
318	0021134		Not Required, Elbow, Right Side Outlets	1
319	0007308		Not Required, Elbow, Large Diameter Outlet	1
320	0089394		Not Required, Outlet Control, No Pump	1
321	0029106		Not Required, Deluge Outlet	1
322	0029302		No Monitor Requested	1
323	0029304		No Nozzle Req'd	1
324	0029107		No Deluge Mount	1
325	0519936		Not Required, 1.50" Crosslays, Rescue	1
326	0029260		Not Required, Speedlays	1
327	0500535		Not Required, Hose Restraint, Crosslay	1
328	0750536		Hose Restr, Spdly, Not Required, No Spdly	1
329	0046372		Not Required, Foam System, Pump, or Plumbing	1
330	0012126		Not Required, CAF Compressor	1
331	0552517		Not Required, Refill, Foam Tank	1
332	0042573		Not Required, Foam System Demonstration	1
333	0045465		Not Required, Foam Tanks	1
334	0091110		Not Required, Foam Tank Drain	1
335	0091079		Not Required, Foam Tank #2	1
336	0091112		Not Required, Foam Tank #2 Drain	1
337	0518339		Not Required, Pump House, Rescue	1
338	0000261		Not Required, Pump Panel Layout	1
339	0030701		Not Required, Material, Pump Panels, No Panel	1
340	0046495		Not Required, Pump Access, No Pump	1
341	0092531		Not Required, Pump House Structure	1
342	0002624		Not Required, No Chassis Engine Gauges @ Pump Panel	1
343	0046400		Throttle, Engine Not Req'd, No Pump / Skid Pump	1
344	0046378		Not Required, Gauges, Vac/Pressure, No Pump	1
345	0046375		Not Required, Gauges, No Pump	1
346	0035650		Not Required, Water Level Gauge	1
347	0006774		Not Required, Foam Level Gauge	1
348	0046280		Not Required, Light Shield, No Pump	1
349	0606694		Air Horns, (2) Hadley, 6" Round, In Bumper	1
350	0606834		Location, Air Horns, Bumper, Each Side, Outside Frame, Inboard (Pos #2 & #6)	1
351	0006064		Control, Air Horn, DS & PS Foot Sw	1
352	0006100		No Electronic Siren	1
353	0046133		No Siren Location	1
354	0076155		No Siren Switch	1
355	0006188		No Speaker	1
356	0550461		Location, Not Required, No Speaker (Q2B)	1
357	0016080		Siren, Federal Q2B	1
358	0006095		Siren, Mechanical, Mounted Above Deckplate	1
359	0026160		Location, Siren, Mech - a) Left	1
360	0642299		Control, Mech Siren, Horn Ring, PS Foot Sw	1
361	0642299		Grounding Strap, Q2B Siren Motor to Ground Stud	1
361	0603446	SP	Lightbar, WIn, Freedom IV-Q, 92", RRR_WR_RWOptWR_RW_RRR	1
			Opticom Priority - b) High	
			Opticom Activation - Cab Switch & E-Master	

Line	Option	Type	Option Description	Qty
361			Momentary Opticom Activation - No Activation	
362	0540451		Filter, Whl Freedom Ltbrs - No Filters	
			Light, Front Zone, Wln M6* LED, Colored Lens, 4lts Q Bezel	1
			Color, Lt DS Frnt Outside - DS Front Outside Red	
			Color, Lt PS Frnt Outside - PS Front Outside Red	
			Color, Lt DS Front Inside - w) DS Front Inside White	
			Color, Lt PS Front Inside - w) PS Front Inside White	
363	0653937		Flasher, Headlight Alternating	1
364	0604753	SP	Headlt flash deactivation - a)w/high beam	
			Lights, Side Zone Lower, Wln M6**, M6V2**, M6V2**, 3pr	1
			Location, Lights Front Side - b)each side bumper	
			Color, Lens, LED's - m)match LED's	
			Color, Lt Side Front - Red	
			Color, Lt Side Middle - Blue	
			Color, Lt Side Rear - Red	
			Control, Scene Lts - Cab Sw Panel DS and Directional Light	
			Location, Lights Mid Side - Rearward of Crew Cab Doors	
			Location, Lights Rear Side - Between Tandem	
365	0634517		Lights, Side, Wln M6* LED w/45 Degree Bezel, Cab Corner, pair	1
			Qty, Lights, Pair - 1	
			Control, Light - b) side warning	
			Color,Whln Sup600 LED - a) rd/rd	
			Material, Bracket - Polished S/S	
366	0540777		Lights, Rear Zone Lower, Wln M6* LED, Colored Lens	1
			Color, Lt DS Rear - r) DS Rear Lt Red	
			Color, Lt PS Rear - b) PS Rear Lt Blue	
367	0753704		Lights, Rear/Side Up Zone, Wln M9** LED, Features 4lts	1
			Color, Lens, LED's - Match	
			Color, Lt, Side Rear Upper DS - Side Rear Upper Red	
			Color, Lt, Side Rear Upper PS - Side Rear Upper Red	
			Color, Lt, Rear Upper DS - r) DS Rear Upper Red	
			Color, Lt, Rear Upper PS - r) PS Upper Rear Red	
			Color, Trim - Chrome Trim	
368	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
369	0791493		Light, Traffic Directing, Wln TAM65 36" Long LED	1
			Activation, Traffic Dir L - Not Connected	
370	0529860		Location, Traf Dir Lt, Surface Mounted Over Rear Door	1
371	0530288		Location, Traf Dir Lt Controller, Overhead Recessed Console, above Eng Tnl DS	1
372	0006646		Electrical System, 120/240VAC, General Design	1
373	0066711		Generator, Onan 40kW, Three Phase, PTO Drive (40,000W Cont. Rating)	1
374	0016645		Location, PTO Generator, Between the Frame Rails	1
375	0016752		Starting Sw, Truck Engine Powered Gen, Cab Sw Pnl	1
376	0016757		Not Required, Remote Start, Generator	1
377	0016740		Not Required, Fuel System	1
378	0016767		Not Required, Oil Drain Extension, Generator	1
379	0016771		Not Required, Routing Exhaust, Generator	1
380	0036738		Circuit Breaker Panel, Included With PTO Generator	1
			Location, Circuit Breaker Panel - LS6, Back Wall to the Left	
381	0092381		Guard, Splash Guard for PTO Generator Between the Frame Rails, Stainless Steel	1
382	0699120		Light, Wln, 150W 120V, PFP2AC* LED Floodlt, PBA203 Recessed 15 Deg 1st	8
			Location, 120/240 Volt Lt - Location will be three down each body side and two on the rear	
			Qty, - 08	
			Switch, Lt Control 1 - n) No Control	
			Switch, Lt Control 2 - n) No Control	
			Switch, Lt Control 3 - n) No Control	
			Switch, Lt Control 4 - n) No Control	
			Color, Wln Lt Housing - White Paint	
383	0609095	SP	Light Twr, W-B Pow NS4.5-1400 SPC-MAX, 4-J28 240VAC Lts Cld 15'	1
			Detector, AC Lt Tower - n) Not Include AC Detector	
			Color, Tower, Wlb - White Paint	
384	0639593		Location, Light Tower, Rescue Body Roof, Forward	1
385	0617738		Controller, Light Tower, W-B, Wired Handheld, E-STOP Pow, Pow X, Vrt	1
386	0664785		Location, Light Tower Controller, Near the Circuit Breaker Panel	1

Line	Option	Type	Option Description	Qty
387	0006825		Reel, Elect Cable, Hannay, 1600, (3) Wire Qty, Cord Reels - 2 Reel Guide - b) Captive roller Finish, Reel - Painted Gray Location, Electric Cord Reel - P1, High & Right, 1 Reel and D1, High & Left, 1 Reel	2
388	0006828		Cord, Electric, 10/3 Yellow, 3 Wire Lengths of Elect Cord - 2 Feet of Yellow Cord - c)150 Connection, Cord - Hubbell 15A 120V Str Blade	2
389	0780350		Receptacle Strip, 15A 120V 6-Place, Interior Cab Qty, - 1 Location 1 - 120 volt receptacle that the power stripe plugs into will be located behind the drive seat recessed in side wall, power stripe will be ran thru the crew cab floor rear of engine tunnel and coiled loose with final install by the Customer - see photo	1
390	0781507		AC Power Source - Shoreline Receptacle, 15/20A 120V 3-Pr 3-Wr, NEMA 5-20R SB Dup, 2nd, Interior Cab Qty, - 01 Location 1 - on the raised roof full width shelf toward passenger side AC Power Source - Shoreline Cover, Receptacle - Interior SS Wall Plate(s)	1
391	0781579		Receptacle, 15/20A 120V 3-Pr 3-Wr, NEMA 5-20R SB Dup, 1st, Interior Cab Qty, - 01 Location 1 - high on driver side crew cab rear wall upper outboard corner AC Power Source - Shoreline Cover, Receptacle - Interior SS Wall Plate(s)	1
392	0752367	SP	MODIFICATION, Receptacle Location, Interior Cab	1
393	0779698		Receptacle Strip, 15A 120V 6-Place, Interior Body Qty, - 02 Location 1 - ONE (1) ON THE PS BODY INTERIOR FRONT TO BACK CABINET #1. ONE (1) ON THE DS BODY INTERIOR FRONT TO BACK CABINET #1, DO NOT MOUNT THIS POWER STRIP, JUST SHIP THE STRIP LOOSE AND MOUNT THE RECEPTACLE. AC Power Source - Shoreline	2
394	0783675		Receptacle, 15/20A 120V 3-Pr 3-Wr, NEMA 5-20R SB Dup, 2nd Location, Receptacles - one in D4 and P4 Qty, - 02 AC Power Source - Shoreline Cover, Receptacle - Exterior Flip Up Duplex Cover(s)	2
395	0510697		Breathing Air Cascade Sys. (4) 6000 UN, Storage Cyl. Location, Cascade Bottles - P1 adjacent to the fill frag station	1
396	0016855		Breathing Air System General Design	1
397	0501818		Demonstration, Breathing Air System, at Factory	1
398	0510673		Air Control Panel, SpaceSaver Integral, Breathing Air System Qty, Storage Banks - SpaceSaver 4 Bank Config, ACP Regulator - k) 2-HP,1-LP Config, ACP Booster - a) no pump Config, Compressor - b) with	1
399	0090430		Fill Encl, 2 Bottle,"SpaceSaver"Model 100A,13" Wide, RSP Location - P1 Qty, - 01	1
400	0763632	SP	Compressor, Breathing Air, 6000 psi, Scott 10HP, Denver Location - driver side rear compartment	1
401	0620001	SP	MODIFICATION, Pressure Relief Setting , HP Regulator at 6000 PSI	1
402	0059039		Automatic Storage Fill Valve (Priority SCBA fill) from Appleton Comp.	1
403	0762333	SP	Remote Mount, Air Compressor Filters, Body Interior, Slide-out w/Hinged Plate Location - in the body interior compartment over D1 just forward of the electric and air reel	1
404	0006890		Reel, Breathing Air, High Pressure w/200' Hose Location - interior over P1 Qty, Reel - 1 Reel Guide - b) Captive roller Finish, Reel - Painted Gray	1

Line	Option	Type	Option Description	Qty
405	0026890		Reel, Tool Air, Low Press from Cascade w/150' Blue Hose Location - P3 AND D1 Qty, Reel - 2 Reel Guide - b) Captive roller Finish, Reel - Painted Gray	2
406	0044122		Valve, Air Shut-off, Low Pressure Qty, - 02	2
407	0519547		Brand, Hydraulic Tool System, TNT	1
408	0606173		IHT Hydraulic System, Harrison Hydra-Qube Location - driver side front corner of body recessed in 1.00" Bypass - Without Thru-Pump	1
409	0655669		Power Supply, TNT, Quad-PTO, Hydraulic Motor, Quad Power Unit, 10,500 PSI Qty, - 01 Location, Power Unit - compartment P5 on floor Remote Valve - a) With Remote Valve	1
409	0000000	STF	Not Required	0
410	0652361		Hose, Hydra., TNT, 4'-12', Twin Line, Connection Qty, - 04 Color, Hydraulic Hose 1 - h) black/black Color, Hydraulic Hose 2 - h) black/black Color, Hydraulic Hose 3 - h) black/black Location - to go from the accelerator valves to the reels Color, Hydraulic Hose 4 - h) black/black Color, Hydraulic Hose 5 - n) no hose required Color, Hydraulic Hose 6 - n) no hose required	4
411	0762289	SP	Hose, Hydra., TNT, 150', Twin Line, Bonded, Black Qty, - 04 Color, Hydraulic Hose 1 - h) black/black Color, Hydraulic Hose 2 - h) black/black Color, Hydraulic Hose 3 - h) black/black Location - P6 and D5, high and rearward in each compartment Color, Hydraulic Hose 4 - h) black/black Color, Hydraulic Hose 5 - n) no hose required Color, Hydraulic Hose 6 - n) no hose required	4
412	0652363		Hose, Hydra., TNT, 12'-20', Twin Line, Connection Qty, - 04 Color, Hydraulic Hose 1 - h) black/black Color, Hydraulic Hose 2 - h) black/black Color, Hydraulic Hose 3 - h) black/black Location - P6 and D5 reels Color, Hydraulic Hose 4 - h) black/black Color, Hydraulic Hose 5 - n) no hose required Color, Hydraulic Hose 6 - n) no hose required	4
413	0607499	SP	Reel, Hyd, CMW 6022, Dual Reel, w/o Hose Qty, Reel - 2 Brand, Model, Age of Tool - TNT, new Reel Guide - b) Captive roller Location - P6 and D5, high and rearward in each compartment	2
414	0024055		Fluid, Mineral Oil, One Gallon (fills 1 reel) Qty, - 02	2
415	0679679	SP	Valve, Accelerator, TNT, RV-ATT Location - D5 and P6 near reels Qty, - 02	2
416	0007150		Bag of Nuts and Bolts Qty, Bag Nuts and Bolts - 1	1
417	0602524		NFPA Required Loose Equipment, Special Services, NFPA 2016, Provided by Fire Dept	1

Line	Option	Type	Option Description	Qty
418	0796255		Not Required, Soft Suction, Rescue No Pump	1
419	0602533		Extinguisher, Dry Chemical, Special Services, NFPA 2016, Provided by Fire Dept	1
420	0602351		Extinguisher, 2.5 Gal. Press Water, Special Service, NFPA 2016, Prov by Fire Dept	1
421	0559573		Paint, Single Color, Custom	1
			Paint Color, Predefined - #20 White	
422	0636524		Coating, Chassis Frame Assy, With Liner, Hot Dip Galvanized	1
			Paint Color, Frame Assembly, Predefined - Gloss Black	
423	0693797		No Paint Required, Aluminum Front Wheels	1
424	0693792		No Paint Required, Aluminum Rear Wheels	1
425	0007230		Compartment, Painted, Spatter Gray	1
426	0544129		Reflective Band, 1"-6"-1"	1
			Color, Reflect Band - A - e) black	
			Color, Reflect Band - B - t) gold	
			Color, Reflect Band - C - za) black	
427	0510041		Reflective across Cab Face, Imp/Vel	1
428	0536955		Stripe, Chevron, Rear, Diamond Grade, Rescue	1
			Color, Rear Chevron DG - fluorescent yellow green	
429	0027341		Jog, In Reflective Stripe, Single or Multiple	1
			Qty, - 1	
430	0515348		Stripe, Black Outline, Scotchlite on Reflective Band	1
			Qty, - 1	
431	0509398		Stripe, Reflective, Chevron, Cab and Crew Cab Doors Interior	1
			Color, Reflect Band - B - t) gold	
			Size, Chevron Striping - 04	
			Color, Reflect Chev - A - e) black	
432	0544003		Stripe, Reflective, HDR Walk-In Rear/Side Door	1
			Qty, - 01	
			Color, Reflective - a) white	
433	0033179		Lettering Specifications, Reflective	1
434	0686159		Lettering, Reflective, 3.00", (41-60)	1
			Outline, Lettering - Outline and Shade	
435	0686000		Lettering, Reflective, 8.00", (21-40)	1
			Outline, Lettering - Outline and Shade	
436	0515269		Lettering, Reflective 2" Script w/outline	1
			Color, Lettering - e) black	
437	0041534		Emblem, (3) Letter Monogram Style with Lettering, Reflective, Denver, Each	3
			Qty, - 03	
			Location, Emblem - on the front cab doors AND LEFT REAR BODY	
			Color, Reflective - i) gold	
438	0522815		Emblem, American Flag, Waving, Gerber Vision, Pair	1
			Location, Emblem - on the rear crew cab upper windows	
439	0695610		Emblem, Reflective, Per Dept. Submittal, Each	2
			Qty, - 02	
			Location, Emblem - Cab sides.	
			Size, Dept Seal, Reflect - 12" - 14"	
440	0530604	SP	Emblem, (1) RESCUE Graphics, #1, Denver, CO	1
			Location, Emblem - REAR DOOR	
441	0530602	SP	Emblem, (2) RESCUE Graphics, #1, Denver, CO	1
			Location, Emblem - on the upper body sides	
441	0000000	STF	Service - Oil Change and Lube 5-10-99	1
441	0000000	STF	David Clark& Radio Estimate for Denver - 1-9-06	1
			Location - xxx	
			Qty, - 1	
441	0000000	STF	Denver 4 Zico Chain Saw Mounts QM-CSM-L	1
441	0000000	STF	Allison Transmission Service & Parts Manual 5-19-05	1
			Qty, - 1	
442	0031972		Manuals, Two (2), Fire Apparatus Parts, Custom Chassis	1
443	0002905		Manuals, (2) Chassis Service, Custom	1
444	0032434		Manuals, Three (3) or more, Chassis Operation, Custom	3
			Qty, - 03	
445	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
446	0611136		Warranty, Chassis, 3 Year, Velocity/Impel, WA0284	1
447	0696698		Warranty, Engine, Cummins, 5 Year, WA0181	1

Line	Option	Type	Option Description	Qty
448	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
449	0595767		Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	1
450	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
451	0777368		Warranty, Axle, 2 Year, Meritor, General Service, WA0328	1
452	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
453	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
454	0595813		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
455	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
456	0695416		Warranty, Pierce Camera System, WA0188	1
457	0708760		Warranty, Not Applicable, LED Strip Lights	1
458	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
459	0685945		Warranty, Transmission Cooler, WA0216	1
460	0033401		Not Required, Tank Warranty	1
461	0596024		Warranty, Structure, 15 Year, HDR, WA0010	1
462	0693126		Warranty, AMDOR, Roll-up Door, 10 Year/5 Year Painted, WA0185	1
463	0012599		Warranty, Pump, Not Required	1
464	0046370		Not Required, Warranty, No Plumbing	1
465	0641372		Warranty, Foam System, Not Available	1
466	0642011		Warranty, Onan Generator, 5 Year, Hydraulic, Protec	1
467	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
468	0595412		Warranty, Graphics Lamination, 1 Year, Apparatus, WA0168	1
469	0683627		Certification, Vehicle Stability, CD0156	1
470	0764540		Certification, Engine Installation, Velocity, Cummins X12, 2018	1
471	0686786		Certification, Power Steering, CD0098	1
472	0667417		Certification, Cab Integrity, Velocity FR, CD0009	1
473	0548950		Certification, Cab Door Durability, Velocity/Impel, CD0001	1
474	0548967		Certification, Windshield Wiper Durability, Impel/Velocity, CD0005	1
475	0667411		Certification, Electric Window Durability, Velocity/Impel FR, CD0004	1
476	0549273		Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	1
477	0667416		Certification, Cab Heater and Defroster, Velocity/Impel FR, CD0015	1
478	0667415		Certification, Cab Air Conditioning Performance, Velocity/Impel FR, CD0016	1
479	0545073		Amp Draw Report, NFPA Current Edition	1
480	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
481	0799248		Appleton/Florida BTO	1
482	0000031		HDR BODY	1
483	0000012		PIERCE CHASSIS	1
484	0004713		ENGINE, OTHER	1
485	0046396		EVS 4000 Series TRANSMISSION	1
486	0020037		NO PUMP	1
487	0020013		NO WATER TANK	1
488	0028047		NO FOAM SYSTEM	1
489	0046282		Not Required, Control Panel, No Pump	1
490	0020007		AKRON VALVES	1
491	0020015		ABS SYSTEM	1
492	0658751		PUMPER BASE	1

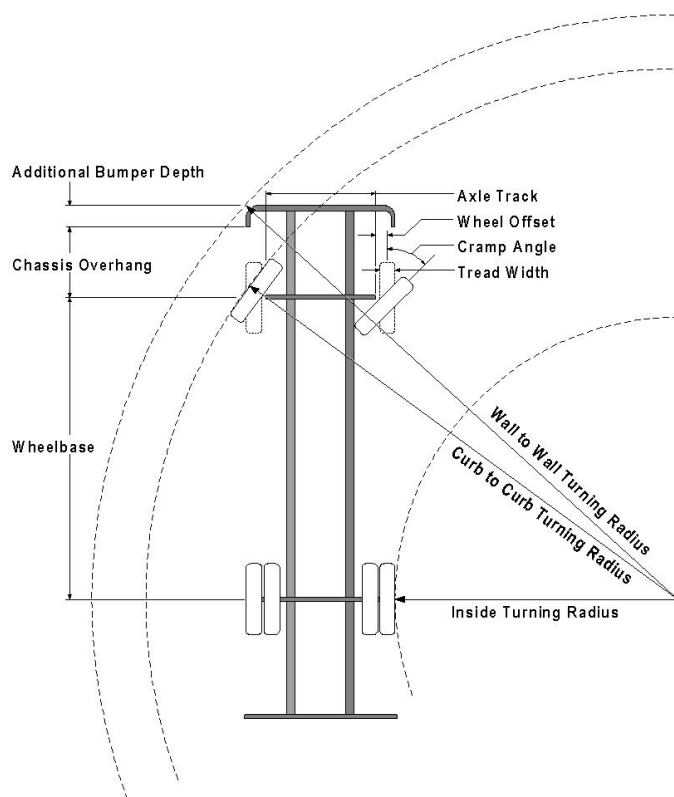


Turning Performance Analysis

12/11/2019

Bid Number: 963
Department: Denver Fire Department

Chassis: Velocity Chassis (Big Block), 2010
Body: HDR, Walk-In, Aluminum



Parameters:

*Inside Cramp Angle:	45°
Axle Track:	82.92 in.
Wheel Offset:	4.68 in.
Tread Width:	16.3 in.
Chassis Overhang:	78 in.
Additional Bumper Depth:	19 in.
Front Overhang:	97 in.
Wheelbase:	258.5 in.

Calculated Turning Radii:

Inside Turn:	20 ft. 6 in.
Curb to curb:	36 ft. 9 in.
Wall to wall:	41 ft. 10 in.

Category	Option	Description
Axle, Front, Custom	0508849	Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel
Wheels, Front	0019611	Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot
Tires, Front	0594821	Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply
Bumpers	0123625	Bumper, 19" Extended, Imp/Vel

Notes:

*Actual Inside cramp angle may be less than shown.

Curb to Curb turning radius calculated for 9.00 inch curb.

Definitions:

Inside CrampAngle	Maximum turning angle of the front inside fire.
Axle Track	King-pin to King-pin distance of front axle.
Wheel Offset	Offset from the center line of the wheel to the King-pin.
Tread Width	Width of the tire tread.
Chassis Overhang	Distance of the center line of the front axle to the front edge of the cab. This does not include the bumper depth.
Additional Bumper Wheel	Depth that the bumper assembly adds to the front overhang.
Wheelbase	Distance between the center lines of the vehicles front and rear axles.
Inside Turning Radius	Radius of the smallest circle around which the vehicle can turn.
Curb to Curb Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures assumes a curb height of 9 inches.
Wall to Wall Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures takes into account any front overhang due to chassis , bumper extensions and or aerial devices.



Electrical Analysis

12/11/2019

Bid #: 963
Desc: Rescue, Walkin, Velocity
Customer: Denver Fire Department

Job #:
Sales Rep: Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0000000	Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v,		0.00	0.50	0.00
0001244	High Idle w/Electronic Engine, Custom		0.00	1.20	0.00
0002526	Light, Engine Compt, All Custom Chassis		0.00	1.60	0.00
0004961	Not Required, Work Lights, Alt. Rear Lights, HDR/Encore, No Hose		0.00	0.00	0.00
0006064	Control, Air Horn, DS & PS Foot Sw		0.00	0.83	0.00
0006825	Reel, Elect Cable, Hannay, 1600, (3) Wire		0.00	72.00	0.00
0006890	Reel, Breathing Air, High Pressure w/200' Hose		0.00	36.00	0.00
0009429	Electric Power Only, Portable Winch		0.00	2.00	0.00
0016080	Siren, Federal Q2B		0.00	100.00	0.00
0026890	Reel, Tool Air, Low Press from Cascade w/150' Blue Hose		0.00	72.00	0.00
0080379	Batteries, (4) Exide Grp 31, 750 CCA ea, Threaded Stud		0.00	3.00	0.00
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel		0.00	180.00	0.00
0543751	Light, Do Not Move Apparatus		0.00	0.80	0.00
0544516	Spotlight, Handheld Cab, Specialty Lighting 2150-1		0.00	7.81	0.00
0548004	Wiring, Spare, 15 A 12V DC 1st		0.00	0.00	30.00
0548006	Wiring, Spare, 15 A 12V DC 2nd		0.00	0.00	15.00
0551758	Lights, Backup, WIn M6BUW, LED, Flange Feature		0.00	3.20	0.00
0552777	Fuel Pump for Repriming		0.00	6.00	0.00
0559130	Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven		0.00	0.00	5.60
0589905	Alarm, Back-up Warning, PRECO 1040		0.00	0.50	0.00
0593759	ESC/ABS/ATC Wabco Brake System, Tandem Rear Axle, 2010		0.00	6.00	0.00
0598207	Switch, Ceiling Lights, 12v Durolumen Red/White Lts, Dual Sw, Dr Wht		0.00	0.00	0.08
0632347	Winch, Warn, 15000 lb. Fixed, Front, Series 15-S Spydura Pro, Electric		0.00	500.00	0.00
0634517	Lights, Side, WIn M6* LED w/45 Degree Bezel, Cab Corner, pair		0.00	2.70	1.80
0650352	Spotlight, Golight Stryker, Model 30**4, LED, 2 Lts		0.00	0.00	3.00
0653526	Camera, Pierce, Driver Mux, Rear Camera Only		0.00	1.20	0.00
0653937	Flasher, Headlight Alternating		0.00	0.00	0.08
0667902	Controls, Electric Windows, All Cab Doors, Impel/Veloccity FR		0.00	26.00	0.00
0667936	Heater/defroster, Dual Zone Control, Impel/Veloccity FR		0.00	0.00	12.10
0678027	Engine Brake, Jacobs Compression Brake, Cummins Engine, with		0.00	0.42	0.00
0762547	Winch, Warn, 15000 lb. Fixed, Rear, Series 15-S Spydura Pro, Electric		0.00	500.00	0.00
0774759	Air Conditioning, Dual Zone Control, Hinge Acc Pnl, Sp Cond, Imp/Vel		0.00	0.00	96.50
0776357	Light, Visor, WIn, 12V P*H2* Pioneer, Cnt Feature, 1st		0.00	0.00	13.00
0784129	Lights, Bolt On Hatch Compt, Pierce LED Strip Lights, HDR		0.00	0.00	0.00
0002758	Amp Draw, NFPA/ULC Radio Allowance	NFPA	5.00	0.00	0.00
0026105	Left Rear Compt, 60" Roll, WI	NFPA	0.90	1.80	0.90
0026109	Right Rear Compartment, 60" Roll, WI	NFPA	0.90	1.80	0.90
0026154	Entrance, Rear, 78" Interior Height, WI	NFPA	3.60	7.20	3.60
0090155	Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	NFPA	0.50	0.00	0.00
0092582	Load Manager/Sequencer, MUX	NFPA	0.56	0.56	0.00
0509649	Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per	NFPA	1.00	0.00	0.00
0515810	Left Over Wheel Compt, 51.50"-51.50", Roll Door, Tandem, WI	NFPA	0.90	1.80	0.90
0515814	Right Over Wheel Compt, 51.50"-51.50", Roll Door, Tandem, WI	NFPA	0.90	1.80	0.90
0536087	Compt, Roof, Bolt On, w/Hinged Cover, Alum Tread	NFPA	2.88	0.00	2.88
0540451	Light, Front Zone, WIn M6* LED, Colored Lens, 4lts Q Bezel	NFPA	1.80	5.40	1.80
0540777	Lights, Rear Zone Lower, WIn M6* LED, Colored Lens	NFPA	1.80	2.70	0.00
0551870	Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir	NFPA	0.83	2.49	0.00
0555915	Wiper Control, 2-Speed with Intermittent, MUX, Impel/Veloccity	NFPA	2.10	8.40	0.00
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Veloccity 2010,	NFPA	1.26	0.00	0.00
0587033	Air Dryer, Brake, AD-9 w/heat, 2010	NFPA	4.70	0.00	0.00

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

12/11/2019

Bid #: 963
Desc: Rescue, Walkin, Velocity
Customer: Denver Fire Department

Job #:
Sales Rep: Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0595087	DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	NFPA	0.60	11.40	0.00
0603446	Lightbar, WIn, Freedom IV-Q, 92", RRR_WR_RWOptWR_RW_RRR	NFPA	6.48	5.16	7.44
0604753	Lights, Side Zone Lower, WIn M6**, M6V2**, M6V2**, 3pr	NFPA	4.20	6.30	3.08
0606251	Vehicle Data Recorder w/Seat Belt Monitor, Body Seating	NFPA	0.50	0.00	0.00
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	NFPA	1.20	0.00	0.00
0629729	Lights, Perimeter, Truck-Lite 44310C LED Grommet Mnt	NFPA	1.00	0.00	0.00
0642591	Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Dash CF	NFPA	2.00	2.00	0.00
0643541	Lights, Interior, 12 VDC, Durolumen R03852 V4, White/Red LED	NFPA	8.75	0.00	0.00
0645685	Lights, Rear Scene, WIn, M6ZC LED, M6P15C 15 Deg Brkt, 42" - 54"	NFPA	4.00	0.00	0.00
0647647	Lights, Dome, FRP Dual LED 4 Lts	NFPA	0.80	0.80	0.00
0648074	Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	NFPA	0.49	0.00	0.00
0648425	Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF	NFPA	0.70	0.70	0.00
0648716	Headlights, Rectangular Halogen, Imp/Vel	NFPA	5.46	7.82	0.00
0657113	Lights, Step, P25 LED, HDR Walk-In, No Rear Entrance, 2lts, Rear Sw	NFPA	0.50	0.00	0.00
0663884	Bracket, License Plate & Light, P25 LED, Temp Under Tailbrd	NFPA	0.07	0.00	0.00
0695719	Lights, Perimeter Body, Truck-Lite 44310C LED 2lts, Rear Step	NFPA	0.50	0.00	0.00
0695735	Lights, Perimeter Cab, Truck-Lite 44310C LED	NFPA	1.08	0.00	0.00
0709438	Light, Walking Surf, FRP Flood, LED	NFPA	2.00	0.00	0.00
0750542	Light, Directional/Marker, Intermediate, Truck-Lite 60421Y LED 2lts	NFPA	0.10	1.00	0.00
0753704	Lights, Rear/Side Up Zone, WIn M9** LED, Features 4lts	NFPA	4.80	7.20	0.00
0759077	Left Forward Compt, 24" & 48" & 48" Roll, WI	NFPA	5.40	10.80	5.40
0762668	Cab, Velocity FR, 7020 Raised Roof, Rear Wall Walk Through, Raised	NFPA	6.80	10.20	0.00
0763549	Right Forward Compt, 38" & 56" & 26", Roll, WI	NFPA	5.40	10.80	5.40
0764546	Engine, Cummins X12, 500 hp, 1695 lb-ft, W/OBD, EPA 2018, Velocity	NFPA	6.00	0.00	0.00
0791493	Light, Traffic Directing, WIn TAM65 36" Long LED	NFPA	1.26	2.52	0.00
0566294	Alternator, 430 amp, Niehoff C680-1	S	0.00	0.00	0.00
Load Totals:			99.72	1634.41	210.36

Note: Minimum Continuous Load is in "Blocking Right of Way" mode.(Reference current edition of NFPA 1901)

Note: Intermittent Load items are not factored in on any alternator load comparisons. These items are included on the report for reference only and should be looked at as amp draw exclusion items. (Reference current edition of NFPA 1901)

Note: Total Connected Load "Demand" represents Total Connected Load minus any Load Managed items

Alternator Output at Idle: 253.00

Minimum Continuous Load	
Supply:	253.00
Demand:	99.72
Variance:	153.28

Alternator Output at Governed Speed: 365.00

Total Connected Load	
Supply:	365.00
Demand:	310.08
Variance:	54.92

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



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DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



Front Range Fire Apparatus is pleased to submit to Denver Fire Department for a **Pierce® Heavy Duty Rescue** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment. This document will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

PIERCE MANUFACTURING was founded in 1913. Since then we have been building bodies with one philosophy, "BUILD THE FINEST". Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 75 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 62,500 apparatus, including more than 33,900 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 870,000 total square feet of floor space situated on approximately 105 acres of land. Our Bradenton, Florida facility has 300,000 square feet of floor space situated on approximately 38 acres of land.

Our beliefs in high ethical standards are carried through in all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current edition of NFPA 1901 standards, this document will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this document are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society B2.1-2000 requirements for structural welding of sheet metal. Our flux core arc welding uses alloy rods, type 7000 and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs and American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that are established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance is included with this document.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to insure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least ten (10) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Front Range Fire Apparatus by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within twenty five (25) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of \$5,000,000 in parts dedicated to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations. You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus. Published component catalogs, which include proprietary systems along with an extensive operators manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVTs, and offers hands-on repair and maintenance training classes multiple times a year.



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



LIABILITY

The successful bidder will defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

INSURANCE PROVIDED BY BIDDER

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence \$1,000,000

Products/Completed Operations Aggregate \$1,000,000

Personal and Advertising Injury \$1,000,000

General Aggregate \$2,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form and will include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy will include Owner as an additional insured when required by written contract.

COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

The successful bidder will, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile liability insurance and coverage will be written on a Commercial Automobile liability form:

Each Accident Combined Single Limit: \$1,000,000

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate: \$3,000,000

Each Occurrence: \$3,000,000

The umbrella policy will be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile Liability policies.



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of Product Liability insurance:

Each Occurrence \$1,000,000

Products/Completed Operations Aggregate \$1,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form. The manufacturer's policy will include the owner as additional insured when required by written contract between the Owner and a Pierce authorized dealer.

UMBRELLA/EXCESS LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Each Occurrence: \$25,000,000

Aggregate: \$25,000,000

The umbrella policy will be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products policies.



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Manufacturer agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as the certificate holder.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pumphouse (including the sheet metal enclosure, valve controls, piping and operators panel) and body will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

SPECIAL INSTRUCTIONS

The apparatus will be designed and built to match the 20562. However, some variation may be necessary due to changes in our manufacturing processes or our product offering. Revisions in NFPA guidelines and/or other regulations may also affect our ability to match the previous unit.

NFPA 2016 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the customer approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the document as "non-NFPA".

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

GENERATOR TEST

If the unit has a generator, the generator will be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.



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INSPECTION TRIP #1

An inspection trip will be provided for two (2) people. Trip will take place at the customer location for a pre-construction conference..

INSPECTION TRIP #2

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a post paint inspection. .

INSPECTION TRIP #3

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a delivery inspection. .

PRODUCT CHANGES AND IMPROVEMENTS

Our components and processes, as described in this document document, are as accurate as known at the time of bid submission, but are subject to change for the purpose of product or process improvements, or changes in industry standards providing the change does not affect the meaning or definition of the bid specifications.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this document. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

A drawing of the apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

VELOCITY CHASSIS

The Pierce Velocity® is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus will be 11' 10" .



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WHEELBASE

The wheelbase of the vehicle will be 272.50" .

GVW RATING

The gross vehicle weight rating will be 70,800 LBS.

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

FRAME REINFORCEMENT

In addition, a full-length mainframe internal "C" liner will be provided. The liner will be an internal "C" design that steps to a smaller internal "C" design over the rear axle. It will be heat-treated steel measuring 12.50" x 3.00" x 0.25" through the front "C" portion of the liner, stepping to 9.38" x 3.00" x 0.25" through the rear "C" portion of the liner. Each liner will have a section modulus of 13.58 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 4,391,869 in-lb.

The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.



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There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be 0 degrees for optimum tire life.

The ball joint bearing will be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.



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FRONT SHOCK ABSORBERS

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

FRONT OIL SEALS

Oil seals with viewing window will be provided on the front axle.

FRONT TIRES

Front tires will be Goodyear® 425/65R22.50 radials, 20 ply G296 MSA tread, rated for 22,800 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 12.25" polished aluminum disc type wheels with a ten (10)stud, 11.25" bolt circle.

REAR AXLE

The rear axle will be a Meritor™, Model RT-46-160, tandem axle assembly with a capacity of 48,000 pounds.

An inter-axle differential, which divides torque evenly between axles, will be provided with an indicator light mounted on the cab instrument panel.

TOP SPEED OF VEHICLE

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 60 mph.

REAR SUSPENSION

Rear suspension will be a Hendrickson Model FMX 482 EX, air ride with a ground rating of 48,000 lb. The suspension will have the following features:

- Outboard vertical mounted heavy-duty shock absorbers
- Utilizes track bars and torque rods to restrict lateral axle movement and maintain constant pinion angles
- Super heavy-duty transverse beam to help reduce axle stress while increasing roll stability or resistance to lean
- Low spring rate air springs for excellent ride quality
- Dual height control valves to maintain level vehicle from side to side

REAR OIL SEALS

Oil seals will be provided on the rear axle(s).



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REAR AIR RIDE SUSPENSION DUMP VALVES

The rear air ride suspension will be supplied with a dump valve system provided by the custom chassis manufacturer.

The control will be located inside the cab.

To prevent accidental activation of the valves, a 5 second timed delay will be built into the control circuit. The chassis back-up alarm will sound when the control is active.

The parking brake must be applied before the control will be active. Release of the parking brake will automatically inflate the suspension.

REAR TIRES

Rear tires will be eight (8) Goodyear 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 54,240 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa© 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE PRESSURE INDICATOR

NFPA 1901, 2016 edition, section 4.13.4 requires each tire be equipped with a visual indicator or monitoring system that indicates tire pressure.

Per Fire Department specification, a tire pressure indicator is not on the apparatus as manufactured. This apparatus will be non-compliant to NFPA 1901 standards effective at time of contract execution.

FRONT HUB COVERS

Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

REAR HUB COVERS

Stainless steel, high hat, hub covers will be provided on the rear axle hubs.

MUD FLAP EVEN WITH FENDERETTS

A mud flap shall be installed so it is even with the outside fenderetts.

MUD FLAPS

Mud flaps with a Pierce logo will be installed behind the front and rear wheels.

CROSSFIRE PRESSURE LABELS

The PSI label for the Crossfire tire pressure equalization system will state 85 PSI.



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TIRE, AIR PRESSURE EQUALIZATION

A Crossfire air pressure equalization system will be provided on the rear dual wheels. This system will equalize the tire air pressure in the rear duals.

STABILIZER SYSTEM (REAR VALVE STEMS)

A valve stem stabilizer system will be provided on the rear duals.

WHEEL CHOCKS

There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS

There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted below the right side rear compartment.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 6S6M, anti-lock braking system. The ABS will provide a six (6) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.



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AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. An "off road traction" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system will be full air type.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

BRAKE SYSTEM AIR COMPRESSOR

The air compressor will be a Cummins/WABCO with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Bendix dual brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 6,653 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel



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- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, will be provided with an automatic spring brake application at 40 psi
- A pressure protection valve will be provided to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa).
- 1/4 turn drain valves on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

- Bendix AD-9 air dryer, with heater and coalescing filter

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AIR INLET

One (1) air inlet with 3D series male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located rearward in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female fitting will also be provided with the loose equipment.

AIR OUTLET

One (1) air outlet will be installed with a female coupling and shut off valve, located in the front body compartment on driver side. This system will tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Female coupling and male fitting will be .25" thread.

A mating male fitting will be provided with the loose equipment.

AIR HOSE

There will be two (2) 25' length(s) of air hose furnished with fittings.

An air chuck will be provided with the air hose. The air chuck will fit the valve stems that are provided on the tires.



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AUXILLARY BRAKING SYSTEMS

When two (2) separate auxiliary braking systems are installed on a unit they will be programmed or wired to provide separate or simultaneous operation.

In this case, it will be the transmission retarder and the Jake Brake. They will be set up so when the retarder comes on, the Jake will activate at the same time.

The Jake will start on deceleration and the transmission retarder will also start on brake application.

Location

COMPRESSION FITTINGS

Any nylon tube on the apparatus that is pneumatic will be plumbed with compression type fittings where applicable.

ENGINE

The chassis shall be powered by an electronically controlled engine as described below:

Make:	Cummins
Model:	X12
Power:	500 hp at 1900 rpm
Torque:	1695 lb-ft at 1000 rpm
Governed Speed:	2000 rpm
Emissions Level:	EPA 2018
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	720 cubic inches (11.8L)
Starter:	Delco 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

The engine shall include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system shall give the owner or repair technician access to state of health information for various vehicle sub systems. The system shall monitor vehicle systems, engine and after treatment. The system shall illuminate a malfunction indicator light on the dash console if a problem is detected.



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HIGH IDLE

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver will be able to turn the engine brake system on/off and have high, medium and low setting.

The high setting of the brake application will activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

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

CLUTCH FAN

A Horton® fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position. A compression fitting will be provided on the fan hub.

ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, rotomolded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will include a Single Module™ aftertreatment device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the aftertreatment device, and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the



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aftertreatment device. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The last 18.00" of the tail pipe will be at a 35 degree angle and without any restriction of hangers or clamps to ensure an easy deployment of an exhaust extraction hose.

RADIATOR

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

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will 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 will be isolated from the chassis frame rails with rubber isolators.

The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will 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.

A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates® silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer.



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The chassis manufacturer will also use Gates brand hose on other heater, defroster and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances a comparable silicone hose from another manufacturer will be used.

Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

RADIATOR SKID PLATE

A lower radiator skid plate will be supplied for protection. The skid plate shall be constructed of .25" steel plate.

VINYL WINTER FRONT

A custom one-piece white vinyl winter front will be provided for use in extreme cold weather. The vinyl will cover the front cab grille and will be held in place with quarter turn fasteners. There will be an 5.50" x 16.00" opening in the center for proper ventilation.

FUEL TANK

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A 0.75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

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

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the driver's side of the body and be covered with a hinged, spring loaded, polished stainless steel door that is marked "Diesel Exhaust Fluid Only".



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The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

AUXILIARY FUEL PUMP

An auxiliary electric fuel pump will be added to the fuel line for priming the engine. A switch located on the cab instrument panel will be provided to operate the pump.

FUEL SHUTOFF

A fuel line shutoff valve will be installed on both the inlet and outlet of the primary fuel filter.

FUEL COOLER

An air to fuel cooler will be installed in the engine fuel return line.

FUEL SEPARATOR

The engine will be equipped with a Racor in-line spin-on fuel and water separator in addition to the engine fuel filters.

TRANSMISSION

An Allison 5th generation, model EVS 4000PR, electronic, torque converting, automatic transmission with retarder will be provided.

Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge, with red light and audible alarm, will be installed on the cab instrument panel.

The transmission retarder control will be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.

The transmission will have the 1600 ft. lb. torque (medium) spring setting for retardation force.

The transmission retarder will have a master "on/off" switch on the instrument panel. A red indicator light will be provided to warn that the transmission is being overworked.

The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.



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

TRANSMISSION SHIFTER

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be:

1st	3.51 to 1.00
2nd	1.91 to 1.00
3rd	1.43 to 1.00
4th	1.00 to 1.00
5th	0.75 to 1.00
6th	0.64 to 1.00
R	4.80 to 1.00

TRANSMISSION COOLER

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission retarder oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

TRANSMISSION FLUID LABEL

A label located on the transmission fluid fill access door will be provided. The label will read "Trans Fluid TRANSynd Only".

DOWNSHIFT MODE (W/ENGINE BRAKE)

The transmission will be provided with an aggressive downshift mode.

This will provide earlier transmission downshifts to 3rd gear from 6th gear, resulting in improved engine braking performance.



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TRANSMISSION FLUID

The transmission will be provided with TranSynd heavy duty synthetic transmission fluid.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it.

The slip joint will be coated with Glidecoat® or equivalent.

STEERING

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braided lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: Denver

The second row of text will be: Fire

The third row of text will be: Department

AUTOMATIC CHASSIS LUBRICATION

A Vogel Automatic Lubrication System will be provided. The lubrication will be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations listed. The electronic control unit that forms part of the system will activate the pump after an adjustable interval time. The unit will control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.



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The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, will be located LS5 back wall high forward corner on the apparatus.

- TAK- 4 Control Arm Pivot Points
- Rear Axle Slack Adjusters
- Rear Axle Brake Cam Screws
- Rear Suspension Spring Pins
- Rear Suspension Shackle Pins

REAR WINCH

A Warn Series 15-S, Spydura Pro, 15,000 lb electric winch will nest below an aluminum treadplate surface at the rear of the body. A treadplate door will be provided for maintenance and access to the winch.

Winch will be mounted on a surface that will not flex when the winch is in use, since it could bind working parts of the winch.

Winch will be braced by a three (3) point mount, as recommended by the winch manufacturer.

The winch will include 100' of 0.437" Warn Spydura Pro synthetic rope, with hook pre-spoiled on the drum.

Winch will have planetary gearing. Electric motor will have a thermal overload protection switch.

Wire cables to battery will be two (2)-gauge or larger. Speed and amperage draw of winch will be variable depending on winch load.

Winch will have a minimum of a 33' remote control cable.

A polished fairlead will be supplied of sufficient strength to accommodate the winch capacity.

A label will be placed on or near the mount that states the maximum winch load rating and the maximum rope load rating that the mount can support.

FRONT WINCH

A Warn Series 15-S, Spydura Pro, 15,000 pound electric winch will nest below the top aluminum treadplate surface of the front bumper. A 28.00" x 10.00" door for





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maintenance and access to the winch direction control lever and remote control plug will be provided. The cover will be provided with a pneumatic stay arm on each side hold-open device.

Winch will be mounted on a surface that will not flex when the winch is in use, since it could bind working parts of the winch.

Winch will be braced by a three (3) point mount, as recommended by the winch manufacturer.

The winch will include 100 feet of .437" Warn Spydura Pro synthetic rope, with hook prespooled on the drum.

Winch will have planetary gearing. Electric motor will have a thermal overload protection switch.

Wire cables to battery will be two (2)-gauge or larger. Speed and amperage draw of winch will be variable depending on winch load.

Winch will have a minimum of a 33' remote control cable.

A polished fairlead will be supplied of sufficient strength to accommodate the winch capacity.

A label will be placed on or near the mount that states the maximum winch load rating and the maximum rope load rating that the mount can support.

BUMPER

A one (1) piece, ten (1) gauge, 304-2B type polished stainless steel bumper, a minimum of 10.00" high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper will be extended 19.00" from front face of cab.

Documentation will be provided, upon request to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge, and suction connections.

GRAVEL PAN

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.



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TOOL BOX

The front bumper extension will have an aluminum tool/chain box installed on the right side. The box will be raised 1.50" above the gravel pan.

TOOL BOX COVER

A bright aluminum treadplate cover will be provided.

The cover will be attached with a stainless steel hinge.

A lift and turn latch will secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes will be painted the same color as the frame.

TOW EYES

Two (2) painted steel tow eyes will be installed under the bumper and attached to the front frame members. The tow eyes will be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow eyes will not be used for lifting of the apparatus.

The inner and outer edges of the tow eyes will have a .25" radius.

The tow eyes will be painted black.

CAB

The Velocity cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing.

To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

The cab will have main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof



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extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be a full-tilt style. A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height from the cab roof to the ground of approximately 102.00". The crew cab section will have a 20.00" raised roof, with an overall cab height of approximately 122.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor to ceiling height inside the forward cab will be no less than 60.25". The floor to ceiling height inside the crew cab will be no less than 72.95" in the center position and 78.75" in the outboard positions.

The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel knee level for optimal occupant legroom.



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REAR WALL WALK THROUGH

A walk through opening will be provided between the crew cab area and the rescue body interior. The clear door dimensions of the opening will be 30.50" wide x 64.00" high.

Seal

The gap between the cab and body will be sealed from the external elements through the use of an inflatable seal. The seal will be attached to the body and will seal against the polymer layer attached to the cab rear wall.

The seal is constructed from a very high quality elastomer EPDM which resists weathering from outdoor elements, temperature, and sun. The seal will be fabric reinforced and fully molded eliminating vulcanizing of the rubber.

Seal Control

The seal will inflate automatically with air from a dedicated air supply tank in the chassis air system. A pressure switch will control an air solenoid valve which will deflate the seal when pressure is applied to the lift cylinders. When the cab is lowered, the solenoid valve will inflate the seal to the required pressure to form a tight seal and hold that pressure at all times.

Trim

The area around the door opening on the rear wall of the cab will be trimmed with a stainless steel sheet providing a mounting surface for the polymer seal surface.

There will be a bright aluminum treadplate threshold provided to protect the inflatable rubber seal around the perimeter of the opening.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

Full-circular, aluminum inner fender liners in the wheel wells will be provided.

PANORAMIC WINDSHIELD

A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive.



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A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of .50" aluminum plate that is welded to both the .25" firewall and .38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.



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CAB LIFT

A hydraulic cab lift system will 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 hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.

The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.

FRONT CAB TRIM

A band of 22 gauge brushed stainless steel trim will be installed across the front of the cab, from door hinge to door hinge. The trim band will be centered on the head lights and applied with two



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(2)-sided tape. A 0.625" self adhesive trim strip will be applied around the perimeter of the trim band.

There will be no covers provided over the painted cab corner where the cab turn signals are located.

SIDE OF CAB MOLDING

Chrome molding will be provided on both sides of cab.

MIRRORS

For enhanced visibility, safety and overall aesthetics, a forward positioned One-Eleven custom mirror will be mounted on each side of the front cab roof corner. Both front cab roof corners will be reinforced with an aluminum casting at the mounting location providing maximum stability for the mirror arm and head assembly. The mirror arm substructure will extend forward and outward of the cab and will be constructed out of 4.00" diameter, 0.25" wall, aluminum tubing. For reduced service cost, the mirror will include a dual breakaway design, controlled by a rotational detent mechanism. In the event of an impact, the mirror arm will breakaway to either the inboard or the outboard position. The One-Eleven mirror head, and injection molded arm cover, will offer a sleek aerodynamic styling with overall width of 115.80" (reduces vehicle width by 7.00" when compared to door mount bus style mirrors). The arm cover finish will be chrome. The mirror head finish will be chrome. The mirror head and arm will provide a seamless appearance, and include a black painted metal cover plate on the underside of the arm to reduce glare. For maximum visibility and safety, a flat mirror section will be provided that measures 83 square inches in reflective area. There will also be an integral convex mirror section that will measure 27 square inches in reflective area. The flat glass and convex section in each mirror will be heated and adjustable with remote controls that are convenient to the driver.

CAB DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 76.46" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab doors will measure a minimum of 37.87" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.

The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental



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activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 1041. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

A chrome grab handle will be provided on the inside of each cab and crew cab door.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

Door Panels

The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high x 4.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door.



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The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps.

CAB EXTERIOR HANDRAILS

A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

The lights will be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high.

WINDOWS INTERIOR TRIM

For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.



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FRONT WINDOWS FOR RAISED ROOF

To enhance both visibility out of and light penetration into the crew cab, two (2) bonded windows will be provided in the front slanted portion of the raised roof. Each window will be approximately 15.00" wide x 17.00" high. The profile of the glass will match the painted metal side sheet opening, creating a uniform threshold appearance. The windows will be bonded to the vehicle using urethane adhesive.

UPPER REAR WINDOWS ON SIDES OF CREW CAB

Two (2) windows will be provided above the crew cab door, along the sides of the raised roof section of the cab, one (1) on each side of the cab. The profile of the glass will match the painted metal side sheet opening, creating a uniform threshold appearance. The windows will be bonded to the vehicle using urethane adhesive. The visibility through each window will measure 35.25" wide x 7.12" high. The windows will be tinted a privacy, dark gray automotive tint.

Window Tint

The window(s) on the front of the slanted raised roof will be tinted privacy dark gray.

STORAGE COMPARTMENTS

Provided on each side of the cab, to the rear of the crew cab access doors, will be a storage compartment.

The compartments will be approximately 10.71" wide x 30.00" high x 14.00" deep.

There will be two (2) double pan doors painted to match the cab exterior with a non-locking D-Ring latch, one (1) on each side of the cab. A web strap for each exterior door will be used as a door stop.

The compartment interior will be painted spatter gray.

Compartment Light

There will be two (2) On Scene Solutions Night Axe, LED strip lights provided, one (1) each hinged side of compartment door openings. The lights will be controlled by an automatic door switch.

EQUIPMENT MOUNTING SHELF

There will be a full width shelf for permanent mounting of equipment provided. A quantity of one (1) will be located across the front of crew cab raised roof area, bottom of shelf should be even with flat roof.

The shelf will have a 1.50" lip around edge.

The shelf will be fabricated from aluminum and will be painted to match the cab interior.



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CAB INTERIOR

With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

The center console will be a high impact ABS polymer and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield.

The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be 36 oz dark silver gray vinyl. All cab interior materials will meet FMVSS 302 (flammability of interior materials).



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CAB INTERIOR PAINT

The following metal surfaces will be painted black, vinyl textured paint:

- Modesty panel in front of driver
- Vertical surface of dash in front of the officer (not applicable for recessed dash)
- Glove box in front of the officer (if applicable)
- Power distribution in front of the officer
- Rear heater vent panels

The remaining cab interior metal surfaces will be painted gray, vinyl texture paint.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

CAB DEFROSTER

To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable metal cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

CAB/CREW CAB HEATER

Two (2) 36,702 BTU auxiliary heaters with 276 SCFM (each unit) of air flow will be provided inside the crew cab, one (1) in each outboard rear facing seat riser. The heaters will include high performance dual scroll blowers, one (1) for each unit. Outlets for the heaters will be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions.



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The heater/defroster and crew cab heaters will be controlled by an integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear independently. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature.

AIR CONDITIONING

Due to the large space inside the cab, a high-performance, customized air conditioning system will be furnished. A 19.10 cubic inch compressor will be installed on the engine.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof. The fans will be mounted on top of the condenser. The condenser cover and mounting legs to be painted white as provided by the A/C manufacturer.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

There will be a hinge on the forward edge of the filter cover and two (2) knob fasteners on the rear edge to allow easy access.

The evaporator unit will have a 49,000 BTU (4.08 tons) rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the evaporator cover per the following:

- Four (4) will be directed towards the drivers location
- Four (4) will be directed towards the officers location
- Eight (8) will be directed towards crew cab area

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

The air conditioner will be controlled by dual zone integral electronic control panels for the heater, defroster and air conditioner. The cab control panel will be located in the center console.



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For ease of operation, the control panels will include variable adjustment for temperature and fan control.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a 0.20" high density polyethylene corrugated material. Each headliner will be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control.

Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide an R-value of 4 per 1.00" thickness.

SUN VISORS

Two (2) smoked Lexan™ sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver side and passenger side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.



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CAB SAFETY SYSTEM

The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will 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.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:



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- Driver side front air bag
- Passenger side knee bolster air bag
- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SIDE ROLL PROTECTION

The SRS system will provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system will deploy the following components in the event of a side roll:

- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SEATING CAPACITY

The seating capacity in the cab will be six (6).

DRIVER SEAT

A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.



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The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER SEAT

A Pierce PS6® seat will be provided in the cab for the passenger. The seat will be a cam action type with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not belted.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A compartment for the radio amplifier will be located on the floor of the cab behind the front passenger seat. A lift-up door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior.

REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle. It will activate an alarm indicating a seat is occupied but not buckled.



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The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt and firmly hold the occupant in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) forward facing, Pierce PS6® foldup seat provided at the driver side outboard position in the crew cab. To provide improved ride comfort, and maximize



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accessibility to the crew cab, the seat will be provided with 17.00" deep foam cushions and the seat back will be provided with 0 degree fixed recline angle. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) forward facing, Pierce PS6® foldup seat provided at the passenger side outboard position in the crew cab. To provide improved ride comfort, and maximize accessibility to the crew cab, the seat will be provided with 17.00" deep foam cushions and the seat back will be provided with 0 degree fixed recline angle. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle, that will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.



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SEAT UPHOLSTERY

All Pierce PS6 seat upholstery will be gray woven with black Imperial 1200 material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of five (5) SCBA brackets.

SEAT BELTS

All seating positions in the cab, crew cab and tiller cab (if applicable) will have red seat belts.

To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

A total of four (4) seating positions will have the adjustable shoulder harness.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 14.1.7.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) dual LED dome lights with black bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.



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The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

In order to ensure exceptional illumination, each white LED dome light will provide a minimum of 10.1 foot-candles (fc) covering an entire 20.00" x 20.00" square seating position when mounted 40.00" above the seat.

CAB SPOTLIGHT

There will be two (2) Golight® Stryker™, Model 30**4, white LED spotlights located on the cab roof, one each side of cab . The spotlights will be mounted on painted pedestals.

These lights may be load managed when the parking brake is applied.

SPOTLIGHT CONTROLLER

There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlights will be located one (1) within reach of the driver overhead and one (1) within reach of the officer overhead.

HAND HELD LIGHT

There will be four (4) Streamlight, Fire Vulcan, Model #44451, hand lights provided with a vehicle mount with 12VDC direct wire charging rack and quick release buckle strap mounted shipped loose.

Each light housing will be orange in color and be provided with a C4, LED and two (2) "ultra bright blue tail light LEDs" The tail light LEDs will have a dual mode of blinking or steady.

HAND HELD SPOTLIGHT

There will be a Specialty Lighting, Model 2150-1, hand held spotlight installed within reach of the officer seat. The light will be furnished with a 9 foot coil cord.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.



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GAUGES

The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (Volts)

- Low volts (11.8 VDC)

- Amber indicator on gauge assembly with alarm

- High volts (15 VDC)

- Amber indicator on gauge assembly with alarm

- Very low volts (11.3 VDC)

- Amber indicator on gauge assembly with alarm

- Very high volts (16 VDC)

- Amber indicator on gauge assembly with alarm

- Tachometer (RPM)

- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

- Fuel level gauge (Empty - Full in fractions)

- Low fuel (1/8 full)

- Amber indicator on gauge assembly with alarm

- Very low fuel (1/32) fuel

- Amber indicator on gauge assembly with alarm

- Engine oil pressure gauge (PSI)

- Low oil pressure to activate engine warning lights and alarms

- Red indicator on gauge assembly with alarm

- Front air pressure gauge (PSI)

- Low air pressure to activate warning lights and alarm

- Red indicator on gauge assembly with alarm



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- Rear air pressure gauge (PSI)

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

- Transmission oil temperature gauge (Fahrenheit)

High transmission oil temperature activates warning lights and alarm

Amber indicator on gauge assembly with alarm

- Engine coolant temperature gauge (Fahrenheit)

High engine temperature activates an engine warning light and alarm

Red indicator on gauge assembly with alarm

- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)

Low fluid (1/8 full)

Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)



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- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.



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Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.



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"Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

CUSTOM SWITCH PANELS

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console



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on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

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

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours



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The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm shall be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed



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- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

MODIFICATION

The mirror control panel is to be relocated to position #8. A blank panel shall take the place of the mirror control panel. The generator PTO panel currently in position #8 is to move to position #12.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliques. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.



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SPARE CIRCUIT

There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate officer side dash area
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125 percent of the protection

The circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

The positive wire will be connected directly to the battery power.

The negative wire will be connected to ground.

Wires will be protected to 15 amps at 12 volts DC.

Power and ground will terminate on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge recessed, as near the top edge of dog house as practical with an enclosure on the inside of engine tunnel for protection - see photo..

Termination will be with 15 amp, power point plug with rubber cover.

Wires will be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

RECESS, DASH PANEL

The dash panel across from the officer will be recessed to accommodate the mounting of miscellaneous items. The recess will be 8.25" down x 7.81" back and 20.88" wide.

INFORMATION CENTER

An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.



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The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

HOME/TRANSIT SCREEN

This screen will display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)



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- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

ON SCENE SCREEN

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

VIRTUAL BUTTONS

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

PAGE SCREEN

The page screen will display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
 - Faults
 - Listed by order of occurrence
 - Allows to sort by system
 - Interlock
 - Throttle Interlocks
 - Pump Interlocks (if equipped)
 - Aerial Interlocks (if equipped)
 - PTO Interlocks (if equipped)



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- Load Manager
 - A list of items to be load managed will be provided. The list will provide a description of the load.
 - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
 - The screen will indicate if a load has been shed (disabled) or not shed.
 - "At a glance" color features are utilized on this screen.
- Systems
 - Command Zone
 - Module type and ID number
 - Module Version
 - Input or output number
 - Circuit number connected to that input or output
 - Status of the input or output
 - Power and Constant Current module diagnostic information
 - Foam (if equipped)
 - Pressure Controller (if equipped)
 - Generator Frequency (if equipped)
- Live Data
 - General Truck Data
- Maintenance
 - Engine oil and filter
 - Transmission oil and filter
 - Pump oil (if equipped)
 - Foam (if equipped)
 - Aerial (if equipped)
- Setup
 - Clock Setup
 - Date & Time
 - 12 or 24 hour format
 - Set time and date
 - Backlight
 - Daytime
 - Night time
 - Sensitivity
 - Unit Selection
 - Home Screen
 - Virtual Button Setup



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- On Scene Screen Setup
- Configure Video Mode
 - Set Video Contrast
 - Set Video Color
 - Set Video Tint
- Do Not Move
 - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicate
 - Driver Side Cab Door
 - Passenger's Side Cab Door
 - Driver Side Crew Cab Door
 - Passenger's Side Crew Cab Door
 - Driver Side Body Doors
 - Passenger's Side Body Doors
 - Rear Body Door(s)
 - Ladder Rack (if applicable)
 - Deck Gun (if applicable)
 - Light Tower (if applicable)
 - Hatch Door (if applicable)
 - Stabilizers (if applicable)
 - Steps (if applicable)
- Notifications
 - View Active Alarms
 - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
 - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

VEHICLE DATA RECORDER

There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a



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laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

SPEAKER WIRE

The apparatus will be pre-wired for future installation of speakers.

There will be two (2) , two (2) conductor wires routed from EACH FROM THE POWER DISTRIBUTION BOX to ONE (1) ROUTED TO THE CEILING IN THE FORWARD WALK-IN BODY AREA AND ONE (1) ROUTED TO THE CEILING IN THE REAR WALK-IN BODY AREA. Each end will terminate with three (3) feet of excess coil.



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RADIO ANTENNA MOUNT

There will be four (4) standard antenna-mounting base(s), Model MATM, with 17 feet of coax cable and weatherproof cap provided for a two (2)-way radio installation. The standard mount will be located on the cab roof, just to the rear of the officer seat and the additional mount(s) will be located on each front corner of raised roof and one in each far corner of the crew cab roof. The cable(s) will be routed DS antenna cable terminated in the officer's kick panel under dash with a 5' loop and all other cables routed to the officer seat box .

VEHICLE CAMERA SYSTEM

There will be a color vehicle camera system provided with the following:

- One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse

The camera images will be displayed on the driver's vehicle information center display. Audio from the microphone on the active camera will be not provided.

The following components will be included:

- One (1) SV-CW134639CAI, camera
- One (1) amplified speaker (if applicable)
- All necessary cables

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have



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a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

SOLID-STATE CONTROL SYSTEM

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g



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IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

The on-board information center will include the following diagnostic information:

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

TECH MODULE WITH WIFI

An in cab module will provide WiFi wireless interface and data logging capability. The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.



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The data logging capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

PROGNOSTICS

A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events.

The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics will include:

- Engine oil and filter
- Transmission oil and filter
- Pump oil (if equipped)
- Foam oil (if equipped)
- Aerial oil and filter (if equipped)

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

VOLTAGE MONITOR SYSTEM

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

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



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DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

- The studs will consist of the following:
- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

ENHANCED SOFTWARE

The solid-state control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements.



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EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.
6. All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.



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The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

Four (4) 12 volt, Exide, Model 31S750X3W, group 31 batteries that include the following features will be provided:

- 750 CCA, cold cranking amps
- 180 amp reserve capacity
- High cycle
- Rating of 3000 CCA at 0 degrees Fahrenheit
- 720 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.



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BATTERY CHARGER

There will be a Kussmaul™ 1200, Model 091-187-12-Remote, battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to the battery charger.

The battery charger will be located in the right body compartment mounted on the right wall mounted as high as practical.

The battery charger indicator will be located near the driver's seat riser with special bracketry.

AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul™, Model 091-55-20-120, 20 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline inlet(s) will include yellow weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline(s) will be connected to yellow.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side rear bulkhead of body.

ELECTRIC POWER FOR WINCH

Electric power provisions will be furnished for the portable winch from the chassis battery system.

The receiver plug will be located ONE (1) EACH SIDE BODY FENDER PANEL.

A total quantity of two (2) receptacles will be provided.



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ALTERNATOR

A C.E. Niehoff, model C680-1, alternator will be provided. It will have a rated output current of 430 amp as measured by SAE method J56. It will also have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

WEATHER PACK CONNECTORS SEALED

All unused open Weather Pack connectors will be plugged with mating tower and shroud connectors and cavity plugs.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

The exception to this will be the fuel sender terminal. The fuel sender terminal will be sealed.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
 - If enabled:
 - "Load Man Hi-Idle On" will display on the information center.
 - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.



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- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
 - ON = not shed
 - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will 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.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

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

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

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome trim housing on each side of the cab grille:



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- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS

There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

INTERMEDIATE LIGHT

There will be two (2) Truck-Lite®, Model 60421Y, amber LED lights furnished, one (1) each side, horizontally in the rear fender panel. The light will double as a turn signal and marker light.

A stainless steel trim will be included with this installation.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Truck-Lite®, Model 35200R, LED lights used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle



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- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

- Two (2) Whelen®, Model M6BTT, red LED stop/tail lights
- Two (2) Whelen, Model M6T, amber LED arrow turn lights

The lights shall be provided with color lenses.

Each light will be installed separately at the rear with Whelen, Model M6FC, chrome flanges.

Two (2) Whelen Model M6BUW, LED backup lights, will be provided with a flange.

LICENSE PLATE BRACKET

There will be one (1) license plate bracket located below the tailboard on a removable bolt-on bracket located left side under tailboard.



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A white LED light will illuminate the license plate. A polished stainless steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

BACK-UP OBSTACLE SENSING SYSTEM

A SenseStat ultrasonic backing sensor system with 4 individual zones and an LED distance display will be provided.

The system will detect objects that are up to eight (8) feet from the rear of the vehicle reading each of four (4) separate sensors, and displaying the distance to the one that is closest to an object.

A 3.5"W x 2.9"L x 1.6"H, four (4) column color LED display located next to driver will show the direction and location of the obstacle. The display will show the distance from the sensor to the obstacle in meters or in feet & fractions of a foot to the sensor that is closest to an object. There will be an audible alarm with volume control integrated into the display.

ELECTRIC FAN IN COMPARTMENT

There will be two (2), 230volt AC, 1100 cfm fans with wire guards installed in the compartment D1 rear wall adjacent to breathing air compressor.

The fans will be activated when the breathing air compressor is started.

PERIMETER SCENE LIGHTS, CAB

There will be a Truck-lite, Model 44310C, 4.00", 12 volt DC white LED light, with Model 40700 grommet mount and Model 95948 pigtail provided for each cab door. Lighting will be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which will be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS

There will be two (2) Truck-Lite, Model 44310C, 4.00" 12 volt DC LED lights with Model 40700, grommet provided under the rear step area on the body, one (1) each side shining to the rear.

The perimeter scene lights will be activated by a switch within reach of the driver is activated and the parking brake is applied.



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ADDITIONAL PERIMETER LIGHTS

There will be two (2) Truck-Lite®, Model 44310C, 4.00" white LED light(s) with Model 40700, grommet(s) provided under centered under D1 and P1.

These additional lights will be controlled with the other body perimeter lights.

STEP LIGHTS

There will be two (2) white 12 volt DC LED step lights provided. The step lights will be provided at the rear of body above the rear platform.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The step lights will be controlled by a switch installed at the rear of the unit, in an easily accessible area.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

REAR SCENE LIGHTS

There will be two (2) Whelen, Model M6ZC, LED scene lights with Whelen, Model M6P15C, 15 degree chrome bezels installed at the rear of the apparatus. These lights will be installed between 42.00" and 54.00" above the ground.

The lights will be controlled by a switch at the driver's side switch panel.

WALKING SURFACE LIGHT

There will be Model FRP, 4" round black 12 volt DC LED floodlight(s) with bolt mount provided to illuminate the entire designated walking surface on top of the body.

The light(s) will be activated when the body step lights are on.

12 VOLT LIGHTING

There will be one (1) Whelen® Model P*H2*, 17,750 lumens 12 volt DC light(s) with a combination of flood and spot optics provided on the front visor, centered.

The housing(s) painted parts of this light assembly to be white.

The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel and LOCATE THE DS AND PS SWITCH IN THE SAME PANEL AS THE GO-LIGHT. VISOR CONTROL FAR LEFT SIDE AND GO LIGHT CONTROL FAR RIGHT SIDE SEE PHOTOS.



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These light(s) may be load managed when the parking brake is applied.

HEAVY DUTY RESCUE BODY CONSTRUCTION

The body will be built as a separate module prior to being mounted onto the substructure. The rescue body will be constructed of 5052 aluminum. The structural support framing and the gussets used will be of 2.00" (51 mm) square 0.125" (3 mm) wall 6061 aluminum alloy tubing. All exterior body corners will be 3.00" (76 mm) radius aluminum, corrosion resistant alloy 6061 extrusions. Spacing of the 2.00" (51 mm) vertical supports will not exceed 14.00" (356 mm) on center. The roof and corner extrusions will be reinforced with interconnecting gusset supports at all stress points. The body will be properly welded into a unitized construction. Proper reinforcing and supports will be utilized throughout the entire construction process to ensure strength and rigidity.

The body will be supported by 2.00" (51 mm) x 2.00" (51 mm) x 0.25" (6 mm) wall aluminum tubing. The cross sill tubes will be spaced approximately 15.00" (381 mm) on center and interconnected to the body from front to rear.

A 1.00" (25 mm) x 3.00" (76 mm) aluminum bar will be used as a stringer and will be welded to the cross sills. The stringer will be used to mount the body to the chassis frame rails.

ROOF CONSTRUCTION

The roof will be integral with the body construction. The roof will be constructed of 0.125" (3 mm) bright aluminum treadplate and supported by 2.00" (51 mm) square 0.125" (3 mm) wall tubing welded in place approximately 12.00" (305 mm) on center. The roof will be further reinforced with 2.00" (51 mm) square gussets welded approximately every 48.00" (1219 mm). The roof perimeters will be constructed of a 3.00" (76 mm) radius extrusion with an integral drip molding. The roof extrusion will also have an inset allowing the roof panel to be recessed into the extrusion giving further support and sealing effect at the outside edge.

The roof panel will be welded to the roof extrusions and supports. All roof seams will be continuously welded.

BODY AND COMPARTMENT SUPPORT

The substructure for the body will not be integral with the body but will be a separate assembly.

The bottom of each lower compartment floor will be supported by an under slung steel angle grid that will be bolted to the chassis frame rails with grade 8 bolts in order to transfer major stress to the chassis frame and not through the body. The under slung support will be constructed of 0.50" (13 mm) x 2.50" (64 mm) x 2.50" (64 mm) steel angle vertical supports. Horizontal members will be 0.38" (10 mm) x 2.00" (51 mm) x 3.00" (76 mm) and 0.38" (10 mm) x 2.50" (64 mm) x 3.50" (89 mm) steel angle.



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The complete substructure will be washed, primed and finish painted before being bolted to the chassis frame. A rubber coating will be applied over the painted under slung support structure for an additional corrosion barrier.

A 3.00" (76 mm) x 0.75" (19 mm) rubber liner will be placed on top of the chassis frame rails. The liner will be used to prevent metal to metal contact where the body stringer rests on the chassis frame rails.

The compartment floors will be bolted to the under slung substructure and the body will be secured to the chassis frame by a minimum of four (4) tie-down assemblies. Each tie-down assembly will consist of two (2) 2.00" (51 mm) x 6.25" (159 mm) x .75" (19 mm) steel plates and two (2) 14.00" (356 mm) long, 0.50" (13 mm) diameter steel rods. The tie-downs will be easily accessible so that the body may be removed.

BODY LENGTH

The length of the body will be 309.00" (7,849 mm).

BODY WIDTH

The width of the body will be 100.00" (2,540 mm). The interior area will be 95.00" (2,413 mm) wide from wall to wall.

Compartment Depth

Standard Depth

All standard depth body compartments will measure 30.00" (762 mm) deep from the outside of the body to the rear compartment wall. The usable depth inside each side body compartment will be 28.00" (711 mm) deep.

Transverse

All transverse side body compartments will have a usable depth of 28.00" (711 mm) at the floor level. These compartments will extend over the frame rails through to the other side of the body.

BODY HEIGHT

The height of the body without any roof mounted items will be 103.25" (2,623 mm) high. The height in the interior of the body will be 78.00" (1,981 mm) high.

Additional options may reduce the overall height throughout the interior of the body. These include, but are not limited to the items listed in the table below.

Item	Change in Interior Height
Roof Mounted A/C with Ducting	-2.00" (51 mm)
Pierce Slide-out Room	-3.00" (76 mm)



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ROOF CONFIGURATION

The roof will be flat without any recessed items.

ROLL-UP DOOR, SIDE COMPARTMENTS

There will be 12 compartment doors installed on the side compartments, double faced, aluminum construction, satin aluminum and manufactured by AMDOR™ brand roll-up doors.

Door(s) will be constructed using 1.00" (25 mm) extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second fin will serve as a wiping seal which will also allow for compression to prevent water ingress.

The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of roll-up door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A stainless steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge to be supplied over lift bar for additional area to aid in closing the door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded roll-up door wear components will be constructed of Type 6 nylon.

Each roll-up door will have a 3.00" (76 mm) diameter balancer/tensioner drum to assist in lifting the door.



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The header for the roll-up door assembly will not exceed 4.00" (102 mm).

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

LEFT FORWARD COMPARTMENTS

First Compartment

The first compartment will be located directly behind the cab. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 26.50" (673 mm) wide x 58.88" (1,496 mm) high. The compartment door frame opening will be 24.00" (610 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 21.50" (546 mm) wide x 50.00" (1,270 mm) high.

Second Compartment

The second compartment will be located behind the first compartment. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 50.88" (1,292 mm) wide x 58.88" (1,496 mm) high. The compartment door frame opening will be 48.00" (1,219 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 45.50" (1,156 mm) wide x 50.00" (1,270 mm) high.

Third Compartment

The third compartment will be located behind the second compartment and directly ahead of the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 50.88" (1,292 mm) wide x 58.88" (1,496 mm) high. The compartment door frame opening will be 48.00" (1,219 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 45.50" (1,156 mm) wide x 50.00" (1,270 mm) high.

Compartment Loading

The first will be capable of holding 800 lb (363 kg). The second and third compartments will each be capable of holding 1,100 lb (499 kg)

LEFT OVER WHEEL COMPARTMENTS

Forward Compartment

A compartment will be provided above the forward tandem wheels. The compartment will be provided with a full-height roll-up door.

The compartment dimensions will be 54.38" (1,381 mm) wide x 30.13" (765 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 27.25" (692 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 22.25" (565 mm) high.



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Rear Compartment

A compartment will be provided above the rear tandem wheels. The compartment will be provided with a full-height roll-up door.

The compartment dimensions will be 57.00" (1,448 mm) wide x 30.13" (765 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 27.25" (692 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 22.25" (565 mm) high.

Compartment Loading

Each compartment will be capable of holding 1,200 lb (545 kg).

LEFT REAR SIDE COMPARTMENT

The left rear side compartment will be located directly behind the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 62.50" (1,588 mm) wide x 58.88" (1,496 mm) high. The compartment door frame opening will be 60.00" (1,524 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 57.50" (1,461 mm) wide x 50.00" (1,270 mm) high.

Compartment Loading

The compartment will be capable of holding 1,400 lb (635 kg).

RIGHT FORWARD COMPARTMENTS

First Compartment

The first compartment will be located directly behind the cab. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 40.50" (1,029 mm) wide x 58.88" (1,496 mm) high. The compartment door frame opening will be 38.00" (965 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 35.50" (902 mm) wide x 50.00" (1,270 mm) high.

Second Compartment

The second compartment will be located behind the first compartment. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 59.88" (1,521 mm) wide x 58.88" (1,496 mm) high. The compartment door frame opening will be 56.00" (1,422 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 53.50" (1,358 mm) wide x 50.00" (1,270 mm) high.

Third Compartment

The third compartment will be located behind the second compartment and directly ahead of the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 27.88" (708 mm) wide x 58.88" (1,496 mm) high. The



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compartment door frame opening will be 26.00" (660 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 23.50" (596 mm) wide x 50.00" (1,270 mm) high.

Compartment Loading

The first and third compartments will each be capable of holding 800 lb (363 kg). The second compartment will be capable of holding 1,100 lb (499 kg)

RIGHT OVER WHEEL COMPARTMENTS

Forward Compartment

A compartment will be provided above the forward tandem wheels. The compartment will be provided with a full-height roll-up door.

The compartment dimensions will be 54.38" (1,381 mm) wide x 30.13" (765 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 27.25" (692 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 22.25" (565 mm) high.

Rear Compartment

A compartment will be provided above the rear tandem wheels. The compartment will be provided with a full-height roll-up door.

The compartment dimensions will be 57.00" (1,448 mm) wide x 30.13" (765 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 27.25" (692 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 22.25" (565 mm) high.

Compartment Loading

Each compartment will be capable of holding 1,200 lb (545 kg).

RIGHT REAR SIDE COMPARTMENT

The right rear side compartment shall be located directly behind the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 62.50" (1,588 mm) wide x 58.88" (1,496 mm) high. The compartment door frame opening will be 60.00" (1,524 mm) wide x 56.00" (1,422 mm) high. The compartment clear door opening will be 57.50" (1,461 mm) wide x 50.00" (1,270 mm) high.

Compartment Loading

The compartment will be capable of holding 1,400 lb (635 kg).

REAR ENTRANCE TO BODY INTERIOR

A single rear entrance door will be provided at the rear of the body. The frame to frame measurement of the rear door opening will be 32.25" (819 mm) wide x 74.00" (1880 mm) high.



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The rear door will be constructed of 0.090" (2 mm) 5052 aluminum with a full box pan design for strength and appearance.

Both the interior and exterior door handles will be flush mounted, chrome plated, paddle type door handles.

The outside handle will be located near the bottom of the door, approximately 55.00" (1397 mm) from the ground, allowing a person of average height to open the door while standing on the ground. The inside door handle will be located approximately half way up the door in the center.

A chrome plated grab handle will be horizontally mounted on the inside of the access door to aid in closing.

The door hinge will be full length polished stainless steel with a 0.25" (6 mm) stainless steel pin. The hinge will be attached to the body and door with stainless steel screws or bolts. (hinges that are welded on will not be accepted.) Isolation tape will be furnished between the hinge and the door jam.

The rear door will be furnished with a polished stainless steel door grabber to hold the door in an open position.

The door will close on the non-hinged sides with two (2) air cell, hollow core extruded rubber seals. One (1) seal will be fastened to the door lap and another larger seal fastened to the door opening flange. The bottom seal will be below the flush sweep out walkway. A closed cell rubber seal will be on the hinge side to provide a complete water tight walk-in rescue unit.

The door will be provided with two (2) windows, one (1) located at the top of the door, and one (1) located at the bottom of the door. The window at the top of the door will be 18.00" (457 mm) wide x 15.00" (381 mm) high window and will have a sliding screen. The window at the bottom of the door will be an 18.00" (457 mm) wide x 15.00" (381 mm) high and will not have a sliding screen.

Both windows will have tinted automotive safety glass.

INTERIOR CONSTRUCTION

Interior Floor

The interior floor construction will include a splash shield, sub-floor and finished floor. The splash shield will consist of a metal sheet welded directly to the horizontal floor support tubes.

Above the splash shield, will be a moisture impervious, 0.75" (19 mm) composite sub-floor panel. The sub-floor will provide an isolation barrier and bonding medium for the final floor material. The final floor will be covered with .125" thick embossed aluminum treadplate .



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The floor will be installed providing a total seal, allowing a complete wash down without any moisture penetrating through to the sub-floor.

Interior Walls/Ceiling

The walkway lower sidewalls (below countertop) will be lined with .125" thick brushed aluminum.

The upper side walls (above the counter tops) will be lined with .125" thick brushed aluminum . The wall covering will include the front and rear walls adjacent to this area.

The ceiling will be lined with .25" thick composite panels with gray laminate finish .

Interior Countertop

The countertops (above the exterior compartments) will be constructed of 0.75" (19 mm) thick composite material, covered with .25" thick composite panels with gray laminate finish overlay. The countertops will be free of any bolts or screws providing a smooth finished surface.

Body Insulation

The ceiling and walls will be insulated using two (2) types of insulating materials providing a combined R-Value range of R13-R17 in the body interior.

A 0.25" (6 mm) double sided foil insulation will be installed against the exterior body skin. The material will reduce thermal transfer from the exterior of the body.

Installed over the foil insulation, will be a layer of 1.50" (38 mm) thick acoustical foam insulation. The foam insulation will provide an additional thermal barrier and sound deadening properties to the body interior.

RIGHT SIDE INTERIOR STORAGE AREA

The interior storage area above the exterior compartments on the right side (curb side) will be 30.00" deep. The counter will overhang into the walkway to allow a 30.00" deep counter top or storage area. This design is in place of the normal 24.00" deep area. Cord and hose will be hung below this overhang. The cabinets/partitions and shelves provided over this area will be 30.00" deep. Any part of the counter that protrudes into the door area will have the corner cut at 45 degree.

BLISTER INTERIOR WALKWAY

A blister will be provided in the interior walkway for the PTO generator.

COUNTER TOP AND LOWER WALL INSULATION

The interior counter top and lower side walls will be provided with 1.00" insulation below the finish material overlay. The insulation will provide an additional R-5 rating in these areas.



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STEPS

Three (3) steps will be provided at the rear of the body for stepping into and out of the body interior in an easy manner.

1) The tailboard step will be constructed of bright aluminum treadplate and will be full width of the walkway by 16.00" deep (inclusive of the rear bumper).

2) The intermediate step will be constructed of bright aluminum treadplate. The step will be full width of the walkway and 16.00" deep.

The area below the intermediate step will be used to house the winch. The compartment will have a drop-down door constructed of bright aluminum treadplate with a "D" ring handle.

LED INTERIOR CEILING LIGHTS

There will be five (5) Durolumen, Model R03852, 12 volt DC LED light(s) with white and red LEDs and a frosted lens in a painted recessed mount in the ceiling of the body interior.

The lights will be equally distributed throughout the body interior providing light to the center walkway.

SWITCH FOR CEILING LIGHTS

Switching will be provided for each colored portion of the Durolumen red/white LED ceiling light(s). There will be two (2) rocker switches provided for the red portion and two (2) rocker switches provided for the clear portion of the lights. Each of these will be configured in a three-way switch configuration.

The first set of switches will be located pass through door area.

The second set of switches will be located Rear door entrance.

In addition to the rocker switches the clear portion of the lights will also be activated when the entrance door is opened at each entry to the body.

SIDE FACING FOLD-DOWN BENCH SEAT WITHOUT STORAGE

A fold-down bench seat with padded backrest will be provided in the interior of the body. The bench seat will be positioned so that it faces the side of the body. The bench seat will be located location DS walkway wall forward.

The bench will be designed with seating for a total of one (1) person. Each person will have a separate bottom cushion and separate backrest cushion.



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Each bottom cushion will be a 22.00" wide padded cushion that is sized to provide a minimum of 15.00" from the front of the cushion to the face of the backrest. Each bottom cushion will be provided with a seat sensor that is connected to the on-board seat belt monitoring system. Each seat will be mounted on a single fold-down seat iron that is spring loaded in order to keep the seat up when not in use. The bottom of the cushion will be covered with brushed stainless steel for a pleasant appearance when the seat is in the up position.

Each backrest will consist of one (1) 22.00" wide x 18.50" high padded cushion.

An automatic retractor type seat belt will be furnished at each seat cushion. An extension will be provided with the seat belt so the male end can be easily grasped and the female end easily located while sitting in a normal position.

The upholstery for both the seat cushion(s) and the backrest(s) will be made of gray woven with black Imperial 1200 material.

HALF ROUND BRACKET

An unpainted stainless steel bracket designed with a half round support plate, will be supplied to hold garden hose, rope, or cord.

A total of six (6) will be provided along the interior wall on the right under the counter top with the first one 6.00" from the counter top recess with 9.42" spacing from edge to edge, 10" wide by 4.5" deep.

UPPER WALL CABINET

There will be a total of one (1) upper wall cabinet(s) provided in the interior of the body. Each cabinet will extend from the counter top to the ceiling, will be 24.00" deep and will be as wide as possible up to a maximum width of 30.00". The cabinet(s) will be constructed of 0.75" composite material and covered with 0.12" aluminum on both sides, bottom and back wall. The aluminum will have a brushed aluminum finish.

Heavy black nylon webbing made of 1.00" nylon strap sewn in a 2.00" box pattern will be provided at the cabinet door opening. The nylon webbing will be permanently mounted at the bottom of the cabinet. The top and sides will be secured with mechanical buckles allowing the webbing to be completely removed from the cabinet storage area.

The cabinet(s) located see print 20562AD -sh2 JOB # 20562 DS front to back #1.

UPPER WALL CABINET

There will be a total of one (1) upper wall cabinet(s) provided in the interior of the body. Each cabinet will extend from the counter top to the ceiling, will be 24.00" deep and will be as wide as possible up to a maximum width of 72.00". The cabinet(s) will be constructed of 0.75"



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composite material and covered with 0.12" aluminum on both sides, bottom and back wall. The aluminum will have a brushed aluminum finish.

Heavy black nylon webbing made of 1.00" nylon strap sewn in a 2.00" box pattern will be provided at the cabinet door opening. The nylon webbing will be permanently mounted at the bottom of the cabinet. The top and sides will be secured with mechanical buckles allowing the webbing to be completely removed from the cabinet storage area.

The cabinet(s) located DS CABINET FRONT TO BACK #7.

UPPER WALL CABINET

There will be a total of one (1) upper wall cabinet(s) provided in the interior of the body. Each cabinet will extend from the counter top to the ceiling, will be 24.00" deep and will be as wide as possible up to a maximum width of 60.00". The cabinet(s) will be constructed of 0.75" composite material and covered with 0.12" aluminum on both sides, bottom and back wall. The aluminum will have a brushed aluminum finish.

Heavy black nylon webbing made of 1.00" nylon strap sewn in a 2.00" box pattern will be provided at the cabinet door opening. The nylon webbing will be permanently mounted at the bottom of the cabinet. The top and sides will be secured with mechanical buckles allowing the webbing to be completely removed from the cabinet storage area.

The cabinet(s) located PS FRONT TO BACK CABINET #6.

UPPER WALL CABINET

There will be a total of ten (10) upper wall cabinet(s) provided in the interior of the body. Each cabinet will extend from the counter top to the ceiling, will be 24.00" deep and will be as wide as possible up to a maximum width of 48.00". The cabinet(s) will be constructed of 0.75" composite material and covered with 0.12" aluminum on both sides, bottom and back wall. The aluminum will have a brushed aluminum finish.

Heavy black nylon webbing made of 1.00" nylon strap sewn in a 2.00" box pattern will be provided at the cabinet door opening. The nylon webbing will be permanently mounted at the bottom of the cabinet. The top and sides will be secured with mechanical buckles allowing the webbing to be completely removed from the cabinet storage area.

The cabinet(s) located PS FRONT TO BACK CABINET #1, 2, 3, 4 & 5.DS FRONT TO BACK CABINET #2, 3, 4, 5 & 6.



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MODIFICATION OF THE RECESSED OPEN STORAGE COMPARTMENT

The rearmost recessed storage compartment on the DS interior will be modified to not have a blister in the D1/LS1 compartment. The recessed storage compartment will be cut, welded and repainted as needed to remove the blister in D1/LS1.

RECESSED OPEN STORAGE COMPARTMENT

There will be a total of three (3) open storage compartment(s) provided in the interior of the body. Each storage compartment will be recessed into the side wall of the walkway directly underneath the countertop with the front of the compartment facing the interior. Each storage compartment will be a rectangular shaped storage space constructed of aluminum that is completely enclosed on all sides with the exception of the front, which will be completely open. A 0.50" high aluminum lip will be provided at the bottom of the opening spanning the full width of the opening.

Each compartment will be no more than 12.00" deep. The height and width of each compartment will be: DS WALL OF WALK-IN BODY. ONE (1) BELOW THE FIFTH, SIXTH AND SEVENTH CABINET FROM THE FRONT. EACH TO MATCH THE WIDTH OF THE CABINET DIRECTLY ABOVE.

The storage compartment(s) will be located driver side interior.

INTERIOR ENCLOSURE FOR REEL

An enclosure will be provided to house the fixed reel over the interior counter top.

The enclosure will be constructed from .125" thick aluminum treadplate.

The enclosure door will be provided with a stainless steel hinge and a recessed lift and turn latch.

An enclosure will be required for a total of four (4) reel(s).

CEILING HANDRAIL

Mounted on the ceiling of the body interior will be a rigidly mounted handrail. The handrail will be an anodized aluminum extrusion with a ribbed design to provide a positive gripping surface.

There will be one (1) provided.

Location will be the full length of the ceiling on the left .

ESCAPE HATCH WITH SKY LIGHT

Escape hatch with skylight will be provided in the body roof.



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Skylight will contain a single pane of automotive safety glass.

Hatch opening will measure 24.00" x 30.00".

Window will measure 15.00" x 22.00".

Hatch and hatch frame will be constructed from .125" aluminum treadplate to match the roof of the body.

A 2.00" high lip will be provided around the perimeter of the opening to prevent moisture from entering the body.

Hatch will be fully welded in place on the body roof.

Hatch cover will have a rubber gasket inside to prevent leakage.

Hatch cover will be secured with two butterfly - style latches and will have two pneumatic cylinders to hold it in the open position.

A "hatch open" indicator light will be provided in the cab.

There will be one (1) provided.

Location will be center in the body roof .

FIXED INTERIOR DIVIDER

A fixed vertical divider will be provided in the interior of the body. The divider will be constructed from .125" thick brushed aluminum.

A total of one (1) will be provided ONE (1) WITHIN THE DS FRONT TO BACK CABINET #7.

RECESSED COUNTER TOP AREA

There will be an area of the interior counter top recessed behind the exterior compartment roll up doors. The area will be finished as part of the adjacent interior cabinet.

There will be one (1) recessed areas provided. The location of each recess will be below second from rear passenger side interior cabinet 9.00" MINIMUM PER CUSTOMER SIGNED DRAWING .

ADJUSTABLE SHELF IN CABINET WITH SPECIAL LOW SIDE HEIGHT

An adjustable shelf will be provided inside an interior cabinet. The shelf will be constructed of 0.188" thick aluminum and provided with a finish that matches the cabinet it is mounted in. The shelf will be constructed with at least one (1) side that is less than 2.00" in height. When any



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shelf or tray is constructed with a height of less than 2.00" for any of the four (4) sides, no capacity rating will be provided for that item.

The shelf will be as wide and as deep as possible to fit in the cabinet.

The shelf will be secured within the cabinet by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment.

The shelf tracks will be finished to match the cabinet.

The side height of the shelf will be as follows:

- Front: 1.00"
- Rear: 2.00"
- Left Side: 2.00"
- Right Side: 2.00"

A total of twelve (12) will be provided and mounted in the cabinet(s) located Interior compartments PS front to back ONE (1) IN P1,P2,P3,P4,P6.DS front to back ONE (1) IN D1,D3,D5,D6,D7 AND TWO (2) IN D4.

ADJUSTABLE SHELF IN CABINET

An adjustable shelf will be provided inside an interior cabinet. The shelf will be constructed of 0.188" thick aluminum with 2.00" high sides.

The shelf will be 40.00" wide x 22.00" deep. There will be two (2) 13.50" wide x 4.00" deep notches in the front side of the shelf spaced approximately 4.50" apart.

The shelf will be secured within the cabinet by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment.

The shelf and tracks will be finished to match the cabinet it is mounted in.

A total of one (1) will be provided and mounted in the cabinet(s) located in the interior body compartment second from rear passenger side interior cabinet. The shelf will be mounted as far inward as possible - See marked up drawing in E folder.

STAINLESS STEEL ON REAR EDGE OF ROOF

The rear edge of the roof will be covered with brushed stainless steel. The material will be fastened to the body extrusion, excluding the corners.



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REAR BUMPER

A bumper will be provided at the rear of the body. The rear bumper will be constructed as an integral part of the rear body substructure with an aluminum treadplate deck mounted to the frame to provide a stepping surface. A 3.00" high kick plate constructed of aluminum treadplate will be provided on the bulkhead surfaces above the bumper.

The bumper will be approximately 13.00" deep and as wide as possible.

A 3.00" radius will be provided on each corner.

ROOF COMPARTMENT

A storage compartment constructed of .12" bright aluminum treadplate will be provided. The compartment will be of single wall design, with a floor, and have a 1.00" flange around the top to provide a weather resistant seal.

The compartment door will be constructed of .12" bright aluminum treadplate that has a 1.00" flange formed down, to provide an additional seal. The compartment door will hinge on the outboard side, with a full length stainless steel hinge. A knurled handrail will be installed on the door for opening. Two (2) gas cylinder struts will assist and hold the door in the open position. A socket and plunger assembly will be provided to hold the door closed. A weatherstrip seal will be provided on the inside of the door around the edges.

The dimensions of the compartment will be TWO (2) ON THE DS 26" W x 9.00" D x LENGTH PER AD, ONE (1) ON PS 26" W x 9" D x LENGTH PER AD AND ONE (1) FORWARD TRANSVERSE x 50" x 9" D. The compartment will be bolted on to the roof of the body.

A total of four (4) will be provided TWO (2) ON THE DS, ONE (1) ON THE PS of BODY ROOF and one transverse forward for the two rear hatch compartments.

COMPRESSOR DOOR

A slide-up door will be provided in the rear adjacent to the rear entrance door and behind the compressor. This door in the up position will allow the compressor to start and draw cooling air in through the door opening and exit through the normal side compartment doors behind the rear wheel.

This door will have an approximate opening of 14.00" wide x 44.00" high.

MULTIPLE LIGHT TOWER ENCLOSURE

An aluminum treadplate enclosure will be provided on the roof to protect multiple roof mounted light towers from damage.



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The enclosure will be three (3) sided with the side facing the rear of the truck being open. There will not be a top on the enclosure. The size of the enclosure will depend on how the towers are mounted.

SIDE HITCH RECEIVERS

There will be one (1) hitch receiver installed through the body fender panel between the tandem rear wheels on each side of the body. The hitch receivers will be constructed of heavy steel tubing and reinforced to the apparatus framework.

Each hitch receiver will be tested to provide a 2:1 straight line pull no-yield safety factor over a maximum load rating of 10,000 lb.

As a result, each of these hitch receivers will be capable of retaining a portable winch with a rating of no more than 10,000 lb. Each hitch receiver will also be capable of being used for rope operations when used with properly rated equipment.

A spring loaded stainless steel door will be provided in the fender on each side of the body to cover the ends of receivers. Each door will have a flush latch provided to prevent the door from opening while not in use. A stainless steel trim ring will be provided to prevent damage to the exterior finish around the opening.

A cutout will be provided in the wheel well openings that are adjacent to each hitch receiver to provide access to the receiver pins. A hinged stainless steel door will be provided in each wheel well opening to cover the cutouts.

ROOF ACCESS LADDER

A Zico model RL-2-6 Quic-Ladder will be provided at the rear of the body.

The ladder handrails will be constructed out of 1.25" (3 mm) heavy-walled aluminum tubing that is covered with a black, heat-resistant, powder coated finish. Each step will have a flat non-skid surface that is 3.00" (76 mm) deep x 18.00" (457 mm) wide. A swing-out and down extension section at the bottom of the ladder will be provided.

The ladder will be mounted on the right side at the rear of the body.

ROOF RECESSED AREA

The Harrision Hydra-Qube JR will be recessed approximately 1.00" into the roof of the walk-in body. The recessed area will be located FRONT DRIVERS SIDE BODY ROOF. NOT TO INTRUDE ON THE INTERIOR CEILING.

The recessed area will be constructed of 0.125" aluminum treadplate and will have one (1) 1.00" diameter drain hole. The drain will be routed to drain below the body.



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The recess area will be sized to allow proper mounting space and clearance for the unit.

COMPARTMENT DIVIDER

A .12" thick aluminum vertical "L" shaped compartment divider will be provided in D1 FORWARD OF DIVIDER. The divider will be secured in place with #10 self tapping screws.

A total of one (1) divider(s) will be provided.

LEFT SIDE UNDER BODY COMPARTMENT

A compartment will be provided on the left side of the apparatus located under the body and ahead of the rear wheels. The compartment will be constructed of bright aluminum treadplate.

The compartment will be provided with an aluminum treadplate, drop down door with a D-ring handle.

The inside of the compartment (clear dimensions) will be 8.00" (203 mm) high and as wide as possible with a maximum width of 60.00" (1,524 mm) wide. The depth inside the compartment depends on the width of the body.

Compartment Depth	
Body Width	Depth (Clear)
100.00" (2,540 mm)	11.00" (279 mm)
96.00" (2,489 mm)	9.00" (229 mm)

A total of two (2) under body compartment(s) will be provided ahead of rear wheels.

RIGHT SIDE UNDER BODY COMPARTMENT WITH DRAWER

A compartment will be provided on the right side of the apparatus located under the body and ahead of the rear wheels. The compartment will be constructed of bright aluminum treadplate.

The compartment will be provided with a slide out drawer that is rated for a maximum distributed load 500 lb (227 kg). The front of the drawer will be constructed of aluminum treadplate to match the compartment. A D-ring handle shall be provided for securing and opening the drawer. Weather stripping will be installed around all opening surfaces to provide a weather resistant seal. The drawer will extend 22.00" (559 mm) from the stowed position. The slide mechanisms will have ball bearings for ease of operation and years of dependable service.

The inside of the drawer (clear dimensions) will be 8.00" (203 mm) high and as wide as possible with a maximum width of 48.00" (1,219 mm) wide. The depth inside the drawer depends on the width of the body.



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Drawer Depth	
Body Width	Depth (Clear)
100.00" (2,540 mm)	26.50" (673 mm)
96.00" (2,489 mm)	24.50" (622 mm)

A total of two (2) under body compartment(s) will be provided ahead of rear wheels .

EQUIPMENT STORAGE RACK

A storage rack will be provided for equipment storage. The rack will consist of a total of twelve (12) storage bins. Each storage bin will be provided in the following dimensions:

- Four (4) storage bins with a clear dimension of approximately 10.00" w x 9.38" h x 25.00" d
- Seven (7) storage bins with a clear dimension of approximately 4.28" w x 12.50" h x 25.00" deep
- One (1) storage bin with a clear dimension of approximately 9.91" w x 12.50" h x 25.00" deep. A 0.50" high lip will be provided on the bottom of the bin along the entire width of the opening.

The configuration of the storage bins will be as follows: per drawing provide, copy in the job folder Please provide an option for a 12 bin rack for the departments dive equipment per attached drawing. This rack will be located in the driver side interior compartment second back from the front.

The rack will be constructed of 0.12" aluminum. The inside of the rack will be left unpainted and the outside of the rack will be painted to match the area it is installed in.

A 0.50" high lip will be provided at the front of the rack along the entire width of the rack.

A retaining strap with hook and loop closure will be provided over each storage slot opening to secure the equipment inside the rack.

The rack will be located in the driver side interior compartment second back from the front..

AIR BAG RACK

A rack for eight (8) air bag(s) will be installed in a horizontal orientation within the AIR BAG RACK DWG. JOB E-FOLDER STAGE 3 "PIERCE DESIGN AIR BAG RACK" DOTTED LINE REPRESENTS 2 BAGS IN SAME SLOT.



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The clear rack slot dimensions will be AIR BAG RACK DWG. JOB E-FOLDER STAGE 3 "PIERCE DESIGN AIR BAG RACK" DOTTED LINE REPRESENTS 2 BAGS IN SAME SLOT.

The rack will be fabricated of 0.125" aluminum, and will be finished to match the compartment interior. Access to each air bag will be provided through a semi-circle cutout in the leading edge of each slot. Nylon straps with hook and loop closures will be provided to hold the air bags in the rack.

ROLLER

There will be two (2) vertical stainless steel 1.00" diameter roller(s) provided D5 rearward edge of door opening and P6 forward edge of door opening

REAR WALL, BODY MATERIAL

The rear wall will be smooth and the same material as the body.

TOW EYES

Two (2) rear painted tow eyes will be located at the rear of the apparatus and will be mounted directly to the chassis frame rails. The inner and outer edges of the tow eyes will have a radius.

COMPARTMENT BLISTER

A blister in the compartment ahead of the rear wheels will be provided to clear the front bracket of the Firemaax suspension. This blister will take away some of the interior area of the compartment.

COMPARTMENT LIGHTING

There will be twelve (12) compartments with On Scene Solutions LED compartment light strips. The strips will be centered vertically along each side of the door framing. The compartments with these strip lights will be located all body compartments.

Any remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door will automatically turn the compartment lighting on.

HATCH COMPARTMENT LIGHTING

There will be LED strip lighting provided for a total of four (4) bolt-on hatch compartment(s). The light will be mounted on the hinged side of the interior in each compartment.

Each light will be wired to an automatic door switch and to the "open door" indicator inside the cab.



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STANDARD DEPTH ADJUSTABLE SHELF

An adjustable shelf will be provided. The shelf will be constructed of 0.188" thick aluminum with 2.00" high sides.

The shelf will be as deep as possible for a standard depth compartment, and as wide as possible for the specified mounting location.

The shelf will be secured within the compartment by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment.

The shelf will have a load capacity of 500 lb.

A total of nine (9) shelves will be provided D5-2, D4-1, ONE IN D1-1 REARWARD OF DIVIDER, P6-1, P5-2 and P4-2.

SPECIAL SIZE STANDARD DEPTH ADJUSTABLE SHELF

An adjustable shelf will be provided. The shelf will be constructed of 0.188" thick aluminum with 2.00" high sides.

The shelf will be as wide as possible for the specified mounting location. The shelf will be designed with a special depth as specified by the requirements of the customer. This special depth will not exceed the depth of a standard depth shelf. The customer requests the special depth to be: D4 half the depth of compartment and P6 7.00" reduced depth.

The shelf will be secured within the compartment by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment.

The shelf will have a load capacity of 500 lb.

A total of two (2) shelves will be provided D4 top shelf and P6 top shelf.

STANDARD DEPTH SLIDE-OUT ADJUSTABLE HEIGHT TRAY

There will be one (1) slide-out tray provided.

Each tray will have 2.00" high sides and a capacity rating of up to 500 lb in the extended position.

Each tray will be as deep as possible for a standard depth compartment and as wide as possible for the specified mounting location.

Each tray will be mounted on a pair of side mounted slides. The slide mechanisms will have ball bearings for ease of operation and years of dependable service. The slides will be mounted to



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shelf tracks to allow the tray to be adjustable up and down within the designated mounting location.

An automatic lock will be provided for both the in and out tray positions. The lock trip mechanism will be located at the front of the tray and will be easily operated with a gloved hand.

The tray(s) will be located D4 just above frame height.

STANDARD DEPTH SLIDE-OUT/TILT-DOWN TRAY

There will be three (3) slide-out trays provided.

The bottom of each tray will be constructed of 0.188" thick aluminum while special aluminum extrusions will be utilized for the tray sides, ends, and tracks. The corners will be welded to form a rigid unit.

The tray will have 3.00" high sides, will be full depth for a standard depth compartment and will be as wide as possible for the specified mounting location.

A spring loaded lock will be provided on each side at the front of the tray. Releasing the locks will allow the tray to slide out approximately two-thirds (2/3) of its length from the stowed position and tip 30 degrees down from horizontal. The tray will be equipped with ball bearing rollers for smooth operation.

Rubber padded stops will be provided for the tray in the extended position.

The capacity rating of the tray will be a minimum of 200 lb in the extended position.

The vertical position of the tray within the compartment will be adjustable.

The tray(s) will be located D2, D3 and P2.

STANDARD DEPTH SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted slide-out tray(s) with provided D1 under breathing air compressor. Each tray will be rated for up to 1,000 lb in the extended position. The tray(s) will be constructed of .25" thick aluminum plate. The tray will be flat with no sides or flanges.

Each tray will be mounted on a SlideMaster, Model SM3-SP, three (3) rail, single direction cargo slide with 100% extension.

RUB RAIL

Bottom edge of the side compartments and rear rails will be trimmed with a bright aluminum extruded rub rail.

Trim will be 2.12" high with 1.38" flanges turned outward for rigidity.



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The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

The rub rails will be spaced out far enough to protect the lift bars on the rollup doors.

BODY FENDER CROWNS

Stainless steel fender crowns will be provided around the rear wheel openings.

A rubber welting will be provided between the body and the crown to seal the seam and restrict moisture from entering.

AIR BOTTLE STORAGE (SINGLE BOTTLE)

A total of seven (7) air bottle compartments will be provided and located FOUR (4) ON THE PS AND THREE (3) BETWEEN THE TANDEM REARWARD ON THE DRIVERS SIDE. ALL TO BE 27" DEEP. The air bottle compartment will be in the form of a round tube, 7.63" diameter, and will be of adequate depth to accommodate different size air bottles. The flooring will be rubber lined and have a drain hole. A stainless steel door with a chrome-plated latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

SINGLE AIR BOTTLE STORAGE IN FENDER PANEL WITH COMMON DEF FILL DOOR

An air bottle storage compartment will be provided in the body fender panel in the space adjacent to the DEF tank fill in the corner of the fender panel. The compartment will have sufficient capacity for storage of one (1) air bottle.

The compartment will have a 7.75" diameter clear opening and will be 26.00" deep.

A black rubber matting will be provided inside the compartment.

A full width door will be provided to cover the both the storage cylinder and the DEF fill. The full width door will be a single, vertically hinged door that is constructed of stainless steel with a polished finish. The door will have a chrome plated flush lift & turn latch. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.



**[Double
Wide
Door]**

ADDED ROOF LADDER

There will be one (1) 14' aluminum roof ladder(s), Series 775-A provided shipped loose. The ladder(s) will have a special outside width of 16.00".

This ladder is non compliant to NFPA 1931, Chapter 4.2.2, "*Standard for Manufacturer's Design of Fire Department Ground Ladders*".



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Per Fire Department specification request of this ladder, the apparatus will be non compliant to NFPA 1901 standards at time of contract execution.

SWING DOWN STEP

A swing down style rear access step will be installed onto the rear tailboard. The step will swing up and stow above the tailboard in the "up" position and swing down for use as a stepping surface in the "down" position.

A chrome plated lift handle will be provided on the underside of the step to aid in raising and lowering the step.

The step will be provided with gas assist cylinders to secure the step in the up and down positions.

The step will be fabricated from polished aluminum treadplate with a Morton Cass insert to provide a non-skid stepping surface.



**[Swing
Down
Step]**

Size of Step	
Non-Walk-In Body	38.50" wide x 8.00" deep
Walk-In Body	31.50" wide x 8.00" deep

When the step is in the "down" position, a text message will be displayed on the Vehicle Information Center multiplex display screen that reads "Rear Step Not Stowed".

When deployed, the step will meet the NFPA requirement for minimum stepping height from the ground.

AIR HORN SYSTEM

Two (2) Hadley round air horns with 6.00" bell will be recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

Air Horn Location

The air horns will be located on each side of the bumper, just outside of the frame rails.

AIR HORN CONTROL

The air horns will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.



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AUXILIARY MECHANICAL SIREN

A Federal Q2B® siren will be furnished. A siren brake button will be installed on the switch panel.

The control solenoid will be powered up after the emergency master switch is activated.

The mechanical siren will be mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

The mechanical siren will be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

GROUND STRAP FROM Q2B TO GROUND STUD

A ground wire will be added to the Q2B siren. The ground wire will run from the siren motor to the ground stud below the bumper deckplate.

FRONT ZONE UPPER WARNING LIGHTS

There will be a 92.00" Whelen® Freedom™ IV lightbar mounted on the cab roof.

The lightbar will include the following:

- One (1) red flashing LED module in the left side end position.
- One (1) red flashing LED module in the left side front corner position.
- One (1) red flashing LED module in the left side first front position.
- Open in the left side second front position.
- One (1) white flashing LED module in the left side third front position.
- One (1) red flashing LED module in the left side fourth front position.
- Open in the left side fifth front position.
- One (1) red flashing LED module in the left side sixth front position.
- One (1) white flashing LED module in the left side seventh front position.
- One (1) 795 LED traffic light controller set to national standard high priority in the left side center front positions.
- One (1) white flashing LED module in the right side seventh front position.
- One (1) red flashing LED module in the right side sixth front position.
- Open in the right side fifth front position.
- One (1) red flashing LED module in the right side fourth front position.
- One (1) white flashing LED module in the right side third front position.
- Open in the right side second front position.
- One (1) red flashing LED module in the right side first front position.



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- One (1) red flashing LED module in the right side front corner position.
- One (1) red flashing LED module in the right side end position.

There will be clear lenses included on the lightbar.

The following switches may be installed in the cab on the switch panel to control the lightbar:

- a switch to control the flashing LED modules
- the traffic light controller will be by a cab switch with emergency master control
- there will be no momentary switch to activate the traffic light controller

The white flashing LEDs and the traffic light controller will be disabled when the parking brake is applied.

The six (6) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

CAB FACE WARNING LIGHTS

There will be four (4) Whelen®, Model M6*, LED flashing warning lights installed on the cab face, above the headlights, mounted in a common bezel.

- The driver's side front outside warning light to be red
- The driver's side front inside warning light to be white
- The passenger's side front inside warning light to be white
- The passenger's side front outside warning light to be red

All four (4) lights will include a colored lens that is the same color of the LED's.

There will be a switch located in the cab, on the switch panel, to control the four (4) lights.

The inside lights may be load managed if colored or disabled if white, when the parking brake is set.

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash. This switch will be live when the battery switch and the emergency master switches are on.

The flashing will automatically cancel when the hi-beam headlight switch is activated or when the parking brake is set.



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SIDE ZONE LOWER LIGHTING

There will be six (6) Whelen®, LED lights chrome trim installed per the following:

- Two (2) Model M6**, 4.31" high x 6.75" long x 1.37" deep flashing LED warning lights, one (1) each side on the bumper extension. The side front lights to be red.
- Two (2) Model M6V2*, 4.31" high x 6.75" long x 2.25" deep flashing LED warning lights with white scene LEDs, one (1) each side of cab rearward of crew cab doors. The side middle lights to be blue.
- Two (2) Model M6V2*, 4.31" high x 6.75" long x 2.25" deep flashing LED warning lights with white scene LEDs, one (1) each side located between the tandems. The side rear lights to be red.

All colored LED's will include a lens that is the same color as the LED's.

There will be a switch in the cab on the switch panel to control the warning lights. The scene lights will be activated by a switch at the driver's side switch panel and when a directional signal is activated.

The scene LEDs may be load managed when the parking brake is applied.

SIDE WARNING LIGHTS

There will be one (1) pair of Whelen, Model M6* LED flashing lights provided.

The lights will be located on the cab corner each side and will be activated with the side warning switch.

The color of the lights will be red Super LED/red lens.

The lights will be mounted on a 45 degree angled forward polished stainless steel bezels.

Any white light will terminate when the parking brake is applied.

REAR ZONE LOWER LIGHTING

Two (2) Whelen, Model M6* LED flashing warning lights with bezels will be located at the rear of the apparatus.

The driver's side rear light to be red.

The passenger's side rear light to be blue.

Both lights will include a lens that is the same color as the LED's.

There will be a switch located in the cab on the switch panel to control the lights.



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WARNING LIGHTS (REAR AND SIDE UPPER ZONES)

There will be four (4) Whelen®, Model M9** 6.50" high x 10.37" long x 1.37" deep LED flashing warning lights provided at the rear of the apparatus with chrome trim.

The side rear upper light(s) on the driver's side to be red.

The rear upper light(s) on the driver's side to be red.

The rear upper light(s) on the passenger's side to be red.

The side rear upper light(s) on the passenger's side to be red.

The lens color(s) to be the same as the LEDs.

There will be a switch located in the cab on the switch panel to control the lights.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen® Model TAM65, 36.00" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen Model TACTL5 control head will be included with this installation.

The control head will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be surface mounted over the rear door, at the rear of the apparatus as high as practical.

The traffic directing light controller will be located within the overhead recessed console above the engine tunnel on the driver's side.

ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT

The following guidelines will apply to the 120/240 VAC system installation:

General

Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).



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Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

Grounding

Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.

An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This conductor will have a minimum ampere rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.

All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.

Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the following information:

- Rated voltage(s) and type (ac or dc)
- Phase



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- Rated frequency
- Rated amperage
- Continuous rated watts
- Power source engine speed

Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.

Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144.00" (3658 mm) in length.

For fixed power supplies, all conductors in the power supply assembly will be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius).

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device will be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

Wiring Methods

Fixed wiring systems will be limited to the following:

- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)
- or
- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

Electrical cord or conduit will not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring will be run as follows.

- Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping
- Separated from fuel lines by a minimum of 6.00" (152 mm) distance

Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.



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Wiring Identification

All line voltage conductors located in the main panel board will be individually and permanently identified. The identification will reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends will be labeled showing function and wire size.

Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, will be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location will be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (762 mm) from the ground.

The face of any wet location receptacle will be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle will be installed in a face up position.

Dry Locations

All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30.00" (762 mm) above the interior floor height.

All receptacles will be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they will be so marked.

Listing

All receptacles and electrical inlet devices will be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages will be rated for the appropriate service.

Electrical System Testing

The wiring and associated equipment will be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test will be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test will be conducted after all body work has been completed.

Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made.



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Operational Test per Current NFPA 1901 Standard

The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by an independent third-party certification organization.

The prime mover will be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

The power source will be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard will be applied to the low voltage electrical system during the operational test.

ONAN 40KW THREE PHASE GENERATOR

The apparatus will be equipped with a complete electrical power system. The wiring and generator installation will conform to the present National Electrical Code Standards of the National Fire Protection Association. The installation will be designed for continuous operation without overheating and undue stress on components.

The generator will be a three phase, 12 lead reconnectable, Onan 40kW driven by a transmission "power takeoff" attached to the side of the transmission.

Generator performance will meet the American National Standards Institute (ANSI) C84.1-1982 voltage requirement as utilized from the receptacle.

Generator will have a built in automatic voltage control.

Generator will have a NEMA MG21 rating.

- Continuous Duty Rating: 40,000 watts
- Phase: Three
- Nominal Cycles: 60 hertz
- Nominal Amp Rating: 111 at 240-volts or 221 at 120-volts
- Engine Speed at Engagement: Idle
- Engine Speed Engaged: 1100/1400 rpm range



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- Generator RPM: 1800 rpm

The output of the generator will be controlled by an electronic governor. The truck engine will be programmed so the generator's output is at 60 hertz.

The main chassis transmission PTO will power the generator. A stainless steel splash guard will be installed to reduce the amount of road spray on this frame-mounted generator.

The generator will be operable in the stationary mode with a shift control located inside the cab with an indicator light to note engagement. For safety, the automatic high idle will be activated through interlocks only after the chassis parking brake control is in the park position, the generator PTO transmission has made a complete shift and the truck transmission is in neutral.

An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

To properly monitor the generator performance and load demands during operation, the generator will be equipped with a full instrument and control package. This panel will be mounted adjacent to the load center. The following instruments will be installed in the panel:

- One (1) Voltmeter
- Three (3) Ammeters
- One (1) Frequency Meter
- One (1) Hour Meter
- One (1) "Power On" Green Indicator Light
- One (1) PTO Engagement Indicator Light
- Two (2) Fuse Holders: With two (2) amp fuses for gauge protection

The meter and indicators will be installed near eye level in the compartment. Instruments will be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used will be accurate within +/- two (2) percent.

In addition to the generator indicators there will be engine, transmission, and truck alarm indicators provided to ensure proper engine and transmission operation.

The system will be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. The wiring, electrical fixtures and components will be to the highest industry quality standards available on the domestic market.



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The equipment will be the type designed for mobile installations subject to vibration, moisture and severe continuous usage.

All electrical wiring from the load center will be fine stranded copper S.O. type with a 600 volt jacket. The wire will be sized to the load and circuit breaker rating. The wire size will be ten (10)-gauge on 30 amp circuits, 12-gauge on 20 amp circuits and 14-gauge on 15 amp circuits. The S.O. cable will be run in corner areas and extruded aluminum pathways built into the body for easy access. Any S.O. cord not run in an enclosed raceway or cable tray will have an additional abrasion resistant covering.

The main load center will have circuit breakers rated to load demand.

Individual breakers will be provided for all receptacles to isolate a tripped breaker from affecting any other on-line equipment.

GENERATOR LOCATION

The generator will be mounted under the body between the frame rails.

GENERATOR START

There will be a switch provided on the cab instrument panel to engage the generator.

CIRCUIT BREAKER PANEL

The circuit breaker panel will be located high on the back wall of compartment LS6 to the left side.

GENERATOR SPLASH GUARD

A stainless steel splash guard will be installed to reduce the amount of road spray on a frame mounted PTO generator.

120 VOLT LIGHTING

There will be eight (8) Whelen, Model PFP2AC*, 120 volt LED floodlight(s) installed in a Whelen, Model PBA203, semi-recessed housing(s) located Location will be three down each body side and two on the rear.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the following:

- no switch location
- no additional switch location
- no additional switch location
- no additional switch location



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LIGHT TOWER

There will be one (1) Will-Burt, Powerlite Model NS4.5-1400 SPC light tower provided.

There will be four (4) Fire Research Spectra MAX Model J28, 28,000 lumens 325 watt 240 volt AC LED light heads included on this tower.

The painted parts of the light tower and the light heads to be white.

The tower will include no AC detector.

This tower will be connected to the Do Not Move Truck Indicator in the cab.

LIGHT TOWER LOCATION

The light tower will be installed forward, on the rescue body roof.

LIGHT TOWER CONTROLLER

There will be one (1) wired handheld controller included.

LOCATION FOR THE LIGHT TOWER CONTROLLER

The light tower controller will be installed near the circuit breaker panel.

ELECTRIC CORD REEL

Furnished with the 120 volt AC electrical system will be a Hannay, Series 1600, cord reel. The reel will be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position.

The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer.

A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length.

A total of two (2) cord reels will be provided one (1) in compartment P1 high and to the right and one (1) in compartment D1 high and to the left.

The cord reel will be configured with three (3) conductors.

CORD

Provided for electric distribution will be two (2) lengths, one (1) for each reel, of 150 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt



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jacketed SOOW cord. A Hubbell 5-15, 15 amp, 120 volt, straight connector body will be installed on the end of the cord.

120 VOLT RECEPTACLE

There will be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed on the raised roof full width shelf toward passenger side. The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the shoreline inlet.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source

120 VOLT RECEPTACLE

There will be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed high on driver side crew cab rear wall upper outboard corner. The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the shoreline inlet.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source

POWER OUTLET STRIP

There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided 120 volt receptacle that the power stripe plugs into will be located behind the drive seat recessed in side wall, power stripe will be ran thru the crew cab floor rear of engine tunnel and coiled loose with final install by the Customer - see photo.

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).



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There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source

MODIFICATION

The 120 volt duplex outlet on the back of the engine tunnel (Option 0780350) will be moved to a position on the outside wall between the driver position and the drivers side rear facing seat position per the customer Post Paint gig list.

POWER OUTLET STRIP

There will be two (2) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided ONE (1) ON THE PS BODY INTERIOR FRONT TO BACK CABINET #1. ONE (1) ON THE DS BODY INTERIOR FRONT TO BACK CABINET #1, DO NOT MOUNT THIS POWER STRIP, JUST SHIP THE STRIP LOOSE AND MOUNT THE RECEPTACLE..

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source

120 VOLT RECEPTACLE

There will be two (2), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with exterior flip up cover(s), installed one in D4 and P4. The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the shoreline inlet.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage



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- Current Rating (amps)
- Phase
- Frequency
- Power Source

CASCADE STORAGE VESSELS

The breathing air cascade system will meet NFPA requirements for a compressed air system that is used to provide air for human respiration, using self-contained breathing apparatus. It will be capable of operating in a range of ambient temperatures between 0 degrees Fahrenheit and 125 degrees Fahrenheit (-18 degrees Celsius and 52 degrees Celsius), with a relative humidity up to and including 100 percent.

All flexible hose will be installed without excessive bending and to prevent cuts, abrasions, and excessive temperatures. Also, the hose will be installed to allow its replacement without requiring removal of major vehicle components or vehicle-mounted equipment.

The breathing air system will be easy to maintain, with an arrangement of components that allows easy inspections, servicing, calibration, and adjustments without removing the components.

All major components in the breathing air system, including accessories, will be clearly identified and labeled. Appropriate caution and warning labels will be affixed where necessary to allow the equipment to be safely operated and maintained.

Two (2) complete manuals that document the operation and maintenance of the system will be provided.

The complete breathing air system will be tested for leaks and for proper functioning prior to its delivery.

The cascade system storage cylinders will consist of the following major components:

- Four (4) Storage Vessels
- Four (4) Storage Vessel Shutoff Valves
- Four (4) Storage Vessel Relief Devices
- One (1) Storage Vessel Mounting Rack
- Four (4) Inlet/outlet Connections

The cascade storage vessels, will each be rated for 6000 psi (414 bar). These vessels will be designed and constructed to conform to the requirements of the United Nations (UN) on the transportation of dangerous goods. Each vessel will hold 510.50 cubic feet (14.45 cubic meters)



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of air at rated pressure, for a total system volume of 2,042 cubic feet (57.82 cubic meters). Each vessel will be equipped with a UN shutoff valve and a built in, burst-disc pressure relief device.

The storage vessels will be installed in compartment P1 adjacent to the fill frag station.

BREATHING AIR SYSTEM GENERAL DESIGN

The air system will meet the requirements for a compressed air system used to provide air suitable for human respiration with self-contained breathing apparatus.

If a compressor or booster system is supplied it will be capable of operating in a range of ambient temperature between 32 degree Fahrenheit and 100 degrees Fahrenheit (0 Celsius and 43 degrees Celsius).

If a cascade system is supplied it will be capable of operating in a range of ambient temperatures between 0 degrees Fahrenheit and 125 degrees Fahrenheit (-18 degrees Celsius and 52 degrees Celsius)

The air system will be capable of withstanding storage temperatures between 0 degrees Fahrenheit and 125 degrees Fahrenheit (-18 degrees Celsius and 52 degrees Celsius) without damage.

The air system in general will be capable of being stored and operated in environments with relative humidity up to and including 100 percent.

All flexible hose will be installed in such a manner as to prevent cuts, abrasions, exposure to damage, excessive temperatures, damage from loose equipment and excessive bending. The hose will be installed in a manner that permits removal of hose without removal of major vehicle components or vehicle mounted equipment.

The air system design will provide for maintainability by ensuring that the arrangement of the components will allow easy inspections, servicing, calibration and adjustment without removing the components.

All major components in the air system, including accessories, will be clearly identified and labeled. Appropriate caution and warning labels will be affixed where necessary to allow the equipment to be safely operated and adjusted.

Two complete manuals will be provided that document the operation and maintenance of the system.

If a compressor is supplied, the temperature of the compressed air will not exceed 25 degrees Fahrenheit (14 degrees Celsius) above ambient temperatures when measured at the discharge nozzle of the compressor after cooler. Audible and visual alarms, automatic shutdown and



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prevention of automatic restart will occur if any of the following conditions exist: low oil level or low oil pressure, high discharge air temperature, more than 24 ppm of moisture in the purification system outlet and if the carbon monoxide level exceeds 10 ppm.

The purification system will be capable of producing the required air quality for a minimum of 50 hours with inlet at 80 degrees Fahrenheit (27 degrees Celsius) at saturation.

Low pressure breathing air supply from reels or in remote locations will be provided with a low air pressure audible alarm warning device when the air volume is at or below 20 percent. This will include upper and lower control stations on aerial devices.

The complete breathing air system will be tested prior to delivery.

The fire department will receive training with this breathing air system. A demonstration of the operation of the breathing air system will be provided at the factory.

This demonstration will include the following:

- Review of all safety items in the system
- Review of all component manuals
- A walk around review of all the components that make up the system
- A hands-on system demonstration of each functional item in the system, during which proper use of the system components will be described
- A demonstration of how to properly shutdown and maintain the system

BREATHING AIR SYSTEM CONTROL PANEL

A control panel for the breathing air system will be provided. The control panel will be 9.75" wide x 42.75" high x 20.50" deep and it will be attached to the side of a SpaceSaver™ fill enclosure. It will be made of aluminum that is 0.18" thick and has a painted, glare-resistant finish.

A painted aluminum box will house and protect the components behind the control panel. The panel will pivot on its mounting fasteners, to allow for maintenance of components behind the panel.

All gauges will be at least 2.50" in diameter, and they will be filled with glycerin. All valves will be a slow-operating screw type that will require minimal force, from three-fingered operation. A rope light will be fastened to the full vertical height of the control panel, to provide uniform illumination to all controls on the panel.



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All tubing that is behind the panel will be stainless steel, with the exception of the supply hoses from the air storage and the hose that runs to the SCBA fill. These tubes and hoses will have a 4:1 safety factor.

A refill fitting will be supplied on the face of the air control panel, to allow the refilling of the system storage cylinders from an external source. With 6000 psi storage cylinders, a male CGA-677 fitting will be provided, and with 4500 and 5000 psi storage cylinders, a male CGA-347 fitting will be provided.

There will be four (4) storage banks, each consisting of one (1) valve and one (1) gauge, provided on the control panel. If there are more cylinders than banks, two (2) cylinders will be connected to the first storage bank (or banks) as needed.

The system will be regulated with one (1) breathing air supplied gauge, one (1) 0-4500 psi regulator, and one (1) regulated pressure gauge. One (1) additional 0-4500 psi high pressure circuit and one (1) additional 0-400 psi low pressure, high flow rate regulated circuit with gauge.

A pressure relief valve preset, at no more than ten percent above the regulator output setting, will be provided. A warning label that specifies the appropriate pressure regulator settings and the pressure relief setting will be placed adjacent to the regulator.

An SCBA fill valve to control the air flowing into the SCBA cylinders will be supplied on the air control panel. An SCBA fill gauge will be supplied on the air control panel, to view the pressure in the SCBA cylinders during filling. This valve and gauge will be used to manually vary the SCBA fill rates in accordance with the SCBA manufacturer's recommendations.

The panel will be configured without a booster pump.

The panel will be configured with a compressor connection.

FILL ENCLOSURE

The fill enclosure will be designed for mobile applications to fill SCBA or SCUBA cylinders. The enclosure will totally enclose the cylinder during the fill process. The enclosure will contain the cylinder and all fragments in the event of rupture during the fill process.

Construction will be of 0.18" plate steel. The fill enclosure door will be constructed of 0.25" stainless steel. The cylinder holders will be lined with a material to protect each cylinder from abrasion.

The fill enclosure will be designed to allow the filling of two (2) SCBA or SCUBA bottles either individually or simultaneously. Access to the enclosure for loading the cylinder will be through a



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manually operated slide up door and tilt out bottle holder. The door will be provided with a device to assist opening and provide smooth operation.

The loading position from the compartment floor to the center of the bottle valve will be 14.60" in the lower holder and 23.50" in the upper holder. This will place the lower loading position at waist height on average height vehicles.

The maximum length of either the SCBA or SCUBA bottle with the valve and fill adapter will be 29.00" in the lower holder and 27.00" in the upper holder.

Automatic safety interlocks will prevent cylinder filling until the door is completely closed. Two (2) fill hoses with SCBA or SCUBA adapters will be provided within the enclosure.

If a cylinder should rupture, rapidly expanding air will be vented through an opening in the bottom of the enclosure and out through the compartment floor. A break away rubber seal will be provided to seal the compartment floor.

To ensure the integrity of the fill enclosure, bidders will provide on request, an independent certification that a production unit has successfully withstood an SCBA cylinder explosion as per NFPA.

The fill enclosure will be a SpaceSaver model 100A. The dimensions of the fill enclosure will be approximately 42.56" high x 13.12" wide x 23.25" deep with a weight of approximately 400 lb.

A total of one (1) will be provided P1 .

BREATHING AIR SYSTEM GENERAL DESIGN

There will be a Scott Safety, 10 HP breathing air compressor will be provided. The compressor will be located driver side rear compartment. The system will be designed to tie into the air storage/charge station module. This will describe the minimum requirements for a complete breathing air compressor. The system will be modular and capable of being supplied as one horizontal module as specified herein. The ability to separate the compressor module from the charge station is for operator safety.

Air Compressor

The air compressor will be a Scott Horizontal, 6000 PSI 10

Charge Rate (14 CFM)

RPM: 1680

Electric motor will be ten (10) horsepower, three phase, 230 volt, 60 HZ.



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Maximum pressure continuous duty is 6000 PSI / 413 Bar

Compressor will be a four (4) stage

Compressor will be lubricated by differential pressure / controlled splash

Compressor will be air-cooled

Enclosed all metal fan blade guard

Flywheel will be precision balanced and fan bladed for excellent cooling capacity

Compressor will be constructed in a "W" design for low vibration and balanced rod load

Ductile iron connecting rods for high strength

Compressor crankcase will be constructed from top grade Aluminum Alloy eliminating excessive weight

Two (2) crankcase covers for quick and easy main bearing replacement and access to crankshaft and connecting rods

Crankshaft will be ductile iron and counterbalanced with large diameter throw for low bearing loads, high strength and long life

Compressor will be constructed with cast iron cylinders

Cylinders will have finned aluminum heads for superior heat dissipation

Compressor will have piston rings on all pistons

Valve housings will be nickel plated for corrosion resistance

Compressor will have stage pressure gauges, intercoolers, relief valves and condensate traps after each stage of compression

Compressor and electric motor will be mounted with an automatic "V" belt adjusting system

Compressor assembly will be open frame

Stainless steel, disc-in plate valve for long wear, excellent heat resistance and dissipation

Purification System

Each purification chamber will have Safety Burst Discs integrated into its base, for maximum safety



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CO and dew point sensors will not be installed in the purification chamber. The purification system will consist of a mechanical oil/moisture separator and two (2) chemical purification chambers. The chambers will be designed to conform to the ASME code of Unfired Pressure Vessels.

Purification chambers will be constructed in aluminum alloy 6082T6 as its anti-corrosive properties exceed all other chamber materials

Purification system will process a minimum of 37,000 SCF of air per cartridge set. Purified air will be measured by the actual weight of Molecular Sieve. Electronic dew point (DP) detection will not be used as a means to claim extended chemical cartridge life.

Sensors will be installed downstream of all chambers so the sampled air is representative of that delivered to the B.A. cylinders

The Purification system will have the following minimum ratings:

- 6000 PSI working pressure
- 4 to 1 safety factor
- 5 to 80 SCF minimum flow capacity
- 37,000 standard cubic feet of air purified per chemical cartridge set

Computerized Control & Monitoring System

All significant functions of the system will be monitored and controlled by a microprocessor Scott X4 controller. The operational status will be presented on an annunciator panel. In the event of an out of tolerance condition, the controller will alarm and stop the compressor. The status and/or cause will be indicated on the annunciator panel. All accumulated times on all significant time sensitive functions will be recorded and displayed on command.

The system will have the following:

- CO and Dew Point Monitor
- Compressor start/stop (stop - advise normal and alarm abnormal condition)
- Discharge air pressure (stop - advise normal condition)
- Auto Condensate drain control (cycle drain function, advise normal condition)
- Auto Drain/Cool Down Cycle (on each shutdown, pressure switch or stop button; advise normal condition)
- Oil level and/or pressure (stop, alarm and advise abnormal condition)
- Give automatic service status for air sample, CO monitor calibration and purifier elements
- Multi-level password feature for security



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- Downloadable history for diagnostic and performance evaluation

Cool Down System

The system will have the capability of dumping all mechanical moisture traps every 15 minutes during compressor operation. Prior to shutdown, manually or automatically, it will open and unload all moisture drain valves. It will run for two (2) to five (5) minutes in order to cool and dry completely purging the system of all accumulated water and oil vapor.

Purification System

- Dew Point monitoring/control (constant monitoring) (stop, alarm and advise abnormal condition)
- Carbon monoxide monitoring/control (constant monitoring) (stop, alarm and advise abnormal condition)
- Auto condensate drain control (advise status normal condition)
- Purge control, dumps the air exiting the purifier in order to clear up temporary alarm conditions (advise status normal condition)

Housekeeping

- Total time on compressor assembly (advise time on command)
- Time since compressor service (re-settable, advise time on command)
- Time since purification cartridge change (re-settable, advise time on command)
- Time on DP monitor cell (re-settable, advise time on command)
- Time on CO monitor cell (re-settable, advise time on command)
- Automatic calibration notification of CO monitors (advise time on command)

Alarms (Audio/Visual)

- High discharge air temperature - with automatic compressor "STOP", the upper limit is factory set
- High discharge air carbon monoxide - with automatic compressor "STOP"
- High discharge air moisture (dew point) - with a "WARN" to advise a pending filter (purification cartridge) change; an "ALARM" with automatic compressor "STOP"
- Low oil level and/or pressure - with automatic compressor "STOP"

Special Features & Controls

- Prolonged run time control. will stop the compressor assembly when predetermined continuous run time has been exceeded. An audio/visual alarm and word advise is presented on the abnormal condition. "RESET" is required
- Time delay for false alarm recognition. Pre-programmed to prevent false alarms from stopping the compressor or initial system setup and on purifier cartridge change.
- Demand Control (in automatic mode)



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- "Emergency Stop" control mounted on the main control panel
- Back light control switch on panel

Display

- Final pressure Storage Full (up to 5000 PSI)
- Discharge Air Temp. Up to 800 Degrees Fahrenheit
- Oil Level/Pressure "GO-NO-GO" Alarm
- Dew Point Level Up to 30 Degrees Fahrenheit, down to minus 100 degrees Fahrenheit
- Carbon Monoxide Level 0 - 200 PPM
- Timing Functions Hours and minutes, calendar date

Demand Control

The compressor will automatically respond to air "demand", keeping the air receivers at full pressure.

Electric Connection

A 60Hz, three (3) phase, 240-volt, 100 amp, three (3)-pole, four (4) wire, pin and sleeve type receptacle rated for up to 30 horsepower will be wired to the power supply and located in an accessible area within sight of the compressor. A mating horsepower rated plug wired to a four (4) conductor cord will also be supplied and wired to the compressor. When disconnected from the receptacle on the truck, the plug and cord will hang out from the compartment down to within 12.00" of the ground.

Compartment Temperature Monitoring

A compartment ambient temperature switch will be installed by the apparatus manufacturer. A temperature sensing device will actuate an audible and visual alarm at the fill station operator's panel, when ambient temperature at this location exceeds 140 degrees.

PRESSURE RELIEF SETTING

The pressure relief for the high pressure regulator(s) will be set at 6,000 psi instead of the standard 4,500 psi setting.

AUTOMATIC STORAGE FILL VALVE

An inlet line will be added to the back of the panel with check valves for each bank, required for automatic filling of the storage banks. The storage fill valve will be automatic, requiring no operator action for proper operation. The storage fill valve (back pressure regulator) will be mounted behind the fill panel and will provide the following function:

Position - Function

Automatic - Route air to storage system when air is not required for filling cylinders.



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Automatic - Bypass storage to top off cylinders when storage pressure is not sufficient.

REMOTE MOUNT AIR COMPRESSOR FILTERS

The filters for the breathing air compressor will be removed from the main unit and remote mounted onto the countertop in the interior of the body. The base will be modified to fit the willower depth of the mounting surface. The filters will be mounted to a hinged plate that is secured with bolts to a stationary base plate. The base plate will be mounted on an under mount style, roller bearing type slide that allows the entire assembly to slide out from the stowed position.

The filters will be located in the body interior compartment over D1 just forward of the electric and air reel.

HIGH PRESSURE AIR REEL

A high pressure hose reel, complete with hose and fittings will be provided. The hose reel will be rated for 6000 psi working pressure and will be capable of holding 200' of high pressure, 0.51" outside dimension hose.

The hose reel will include the following features:

- Side discs with rolled edges and concentric reinforcing ribs
- Roll formed drum with a full length weld
- A bearing to support the axle at each end of the reel in order to provide smooth rotation and eliminate weight on the swivel joint
- Full length reel axle
- Swivel joint inlet that permits the reel to rotate freely while connected.

The reel will be equipped with a 12-volt D.C. electric rewind motor operated by a push button switch which is guarded to prevent accidental operation. The switch will be installed at a height not to exceed 72.00" above the operator's standing position. A properly rated circuit breaker will be provided to protect the rewind motor against short circuits and overload. A 12-volt fuse will protect the rewind control circuit.

The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer.

A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the end of the hose from being wound onto the reel.

The reel will be equipped with 200' of Parflex fill hose, with a rated burst pressure of 24,000 lb. The fill hose will be continuous with no unions. The hose end will have a female CGA 347 swivel connector and line valve equipped with a bleed-off. A metering valve will be provided on the supply side of the hose reel which will be preset to prevent excessive flow rates that might



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cause the fill hose to whip in the event of a failure. A bleed valve will be provided on the supply side next to the reel rewind button to bleed off pressure. To monitor the pressure in the supply line a gauge and valve will be furnished at the air control panel. The reel air will pass through the standard supplied regulator on the air control panel, which will provide 4500 psi maximum air pressure.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate whether the supply is for breathing or utility air, the operating pressure, total hose length and hose size (inside dimension).

A total of one (1) reel will be provided interior over P1 .

AIR REEL FOR TOOLS

An air reel complete with hose and fittings will be provided. The hose reel will be rated for 300 psi working pressure and will be capable of holding 150' of low pressure, 0.38" inside dimension hose.

The hose reel will include the following features:

- The side discs will have rolled edges and concentric reinforcing ribs
- The drum will be roll formed with a full length weld
- A bearing will support the axle at each end of the reel to provide smooth rotation and eliminate weight on the swivel joint
- The reel axle will be the full length of the reel
- The swivel joint inlet will permit the reel to rotate freely while connected.

The reel will be equipped with a 12-volt D.C. electric rewind motor operated by a push button switch which is guarded to prevent accidental operation. The switch will be installed at a height not to exceed 72.00" above the operator's standing position. A properly rated circuit breaker will be provided to protect the rewind motor against short circuits and overload. A 12-volt fuse will protect the rewind control circuit.

The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer.

A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the end of the hose from being wound onto the reel.

A total of two (2) reels will be provided P3 AND D1 .

A label will be provided in a readily visible location adjacent to each reel. The label will indicate utility air, the operating pressure, total hose length and hose size (inside dimension).



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Hose

Each low pressure reel will be equipped with 150' of Goodyear "Insta-Grip", number 9273 heavy duty blue hose with an inside dimension of 0.38". The hose will be continuous with no unions. The hose end will have a female Hansen quick disconnect. To monitor the pressure in the supply line, a gauge and valve will be provided at the air control panel (air control panel priced separately).

TOOL AIR SHUT-OFF VALVE

Installed on the reel will be a shutoff valve.

There will be one for each reel for a total of two (2).

PTO DRIVEN HYDRAULIC SYSTEM

The apparatus will be equipped with a Harrison Integrated Hydraulic Technology (IHT) system for supply of hydraulic power to a single hydraulic circuit. The system will provide flexibility by providing the capability of adding any certified IHT partner component to the hydraulic circuit (hydraulic component priced separately).

The system will incorporate a transmission mounted power take off coupled with an axial piston pump. The pump will be capable of supplying all required flows and pressures required for the system.

There shall be a switch provided on the cab instrument panel to engage the pump. The PTO driven hydraulic system shall not utilize a thru-pump. A bypass solenoid shall not be required

The system will feature a Harrison Hydra-Qube (HQ) for cooling the system. The HQ is a single, open frame, modular unit consisting of a heat exchanger, reservoir and filter. The overall dimensions of unit will be 20.50" high x 19.00" long x 16.00" wide. The heat exchanger will consist of a 15.00" diameter, 12 VDC, 22.5 amp fan. The reservoir will consist of a 5 gallon tank with an in-tank filter.



[Hydra-Qube]

The HQ unit will be located: driver side front corner of body recessed in 1.00".

HYDRAULIC POWER SUPPLY

A TNT, Model Quad-PTO hydraulic power supply will be provided. The hydraulic power supply will be a hydraulic piston motor pump with 10,500 psi maximum operating pressure.

The power supply will be provided with a quick disconnect for the hydraulic lines.

The power supply will supply up to four (4) tools with simultaneous operation.



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The power supply shall be connected to a remote mounted RV-ATT or RV-120 valve (valves priced separately)

The dimensions of the power supply will be 29.50" long x 20.00" wide x 17.25" high and it will weigh approximately 200 lb.

A total of one (1) will be provided compartment P5 on floor.

HYDRAULIC HOSE

A 12'-20' section of TNT high pressure twin hose will be provided.

The hose will be one (1) continuous length, without unions. The hose will be equipped with quick connection type fittings on one (1) end with swivel fittings on the opposite end.

A total of four (4) section(s) of hose will be provided.

The colors of the hose(s) will be:

- Hose One (1): black/black
- Hose Two (2): black/black
- Hose Three (3): black/black



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- Hose Four (4): black/black
- Hose Five (5): no hose required
- Hose Six (6): no hose required

The hose(s) will be located P6 and D5 reels.

HYDRAULIC HOSE

A 150' section of TNT high pressure bonded black twin hose will be provided.

The hose will be one (1) continuous length, without unions, and equipped with quick connection type fittings at the tool end.

A total of four (4) section(s) of hose will be provided.

The color of the hose ends(s) will be:

hose 1 black/black

hose 2 black/black

hose 3 black/black

hose 4 black/black

hose 5 no hose required

hose 6 no hose required

The hose(s) will be located P6 and D5, high and rearward in each compartment .

HYDRAULIC HOSE

A 4'-12' section of TNT high pressure twin hose will be provided.

The hose will be one (1) continuous length, without unions. The hose will be equipped with quick connection type fittings on one (1) end with swivel fittings on the opposite end.

A total of four (4) section(s) of hose will be provided.

The colors of the hose(s) will be:

- Hose One (1): black/black
- Hose Two (2): black/black
- Hose Three (3): black/black
- Hose Four (4): black/black
- Hose Five (5): no hose required



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- Hose Six (6): no hose required

The hose(s) will be located to go from the accelerator valves to the reels.

DUAL HYDRAULIC REEL WITHOUT HOSE

A CMW Products, Model 6022 dual reel will be provided. The dual reel system will consist of a single assembly that contains two (2) separate hydraulic reels. The brand and pressure of hydraulic tools that will be used with this dual reel will be TNT, new.

The dual reel system will be provided with the following:

- A hydraulic hose reel will be provided on both the left and right sides of the dual reel. CMW Products will not include any hose with the dual reel system. The hydraulic hose will be purchased separately and will be installed on the dual reel after purchase from CMW. Each side of the dual reel will be capable of holding:
 - 200' of bonded twinline hydraulic hose (not included)
 - 100' of unbonded twinline hydraulic hose (not included)
- There will be a total of two (2) 12 volt electric motors provided, one (1) to control the reel each side of the dual reel. Each motor will be controlled by a rewind switch that is guarded to prevent accidental operation. The motors will be protected by a circuit breaker and the rewind circuits will be protected by a fuse. The switches will be installed at a height not to exceed 72.00" above the operator's standing position .

For each reel, A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the hose from being wound around the reel.

There will be a total of two (2) reels provided and installed P6 and D5, high and rearward in each compartment.

A label will be provided in a readily visible location adjacent to each hydraulic reel. The label will indicate maximum flow pressure and total length of hose that is intended to be installed on the reel.

HYDRAULIC FLUID

One (1) gallon of mineral oil fluid will be provided for the hydraulic tool system. Oil will be ISO viscosity grade 22.

A total of two (2) will be provided.



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ACCELERATOR VALVE

A TNT RV-ATT accelerator valve will be provided for use with a high pressure hydraulic tool system.

The valve(s) will be located D5 and P6 near reels.

Appropriate labels will be provided on the control.

A total of two (2) will be provided.

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 10.9.3 will be provided by the fire department.

- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than two (2), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- One (1) 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.
- Five (5) fluorescent orange traffic cones not less than 28" (711 mm) in height, each equipped with a 6" (152 mm) retro-reflective white band no more than 4" (102 mm) from the top of the cone, and an additional 4" (102 mm) retro-reflective white band 2" (51 mm) below the 6" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five fluorescent orange traffic cones have illuminating capabilities.
- One automatic external defibrillator (AED).



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DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 10.9.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 10.9.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

7. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
8. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion. A final pure water rinse will be applied to all metal surfaces.
9. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
10. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
11. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-



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component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.

12. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.
13. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacture.

Each batch of basecoat color is checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color is verified again to make sure that it matches the color standard. Electronic color measuring equipment is used to compare the color sample to the color standard entered into the computer. Color specifications are used to determine the color match. A Delta E reading is used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

Pierce Manufacturing paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) meet or exceed the Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels meet or exceed the #6 A.C.T. standard in critical areas. These requirements are met in order for the exterior paint finish to be considered acceptable. The Pierce Manufacturing written paint standards will be available upon request.

The cab and the body will be painted #20 white.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State regulations concerning paint operations.

Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.



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- Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

GALVANIZED CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be hot dip galvanized before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be hot dip galvanized are:

- Frame rails
- Frame liners
- Cross members
- Front frame extension

All galvanized components are inspected for compliance with ASTM specifications.

Battery boxes will be stainless steel.

All components that are not galvanized will be painted primer and gloss black paint.

COMPARTMENT INTERIOR PAINT

The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.



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REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the exterior rear wall. Rear compartment doors, entry doors, or walkway areas will not be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

OUTLINE, REFLECTIVE STRIPE

A Black outline will be applied on the top and the bottom of the reflective band. There will be one (1) set of outline stripes required.

INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS

There will be alternating chevron striping located on the inside of each cab and crew cab door.

The striping will consist of the following colors:

The first color will be black

The second color will be gold

The size of the striping will be 4.00".

REFLECTIVE STRIPE, HDR BODY DOOR(S)

A 6.00" x 16.00" white reflective stripe will be provided across the interior of each body entry door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

The stripe will be provided on one (1) entry door.



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This stripe will meet the NFPA 1901 requirement.

LETTERING

Forty-one (41) to sixty (60) reflective lettering, 3.00" high, with outline and shade will be provided.

LETTERING

Twenty-one (21) to forty (40) reflective lettering, 8.00" high, with outline and shade will be provided.

LETTERING, SCRIPT

Script lettering shall be provided on the rear body compartment door. The lettering will state "Everyone Comes Home".

EMBLEMS

There will be three (3) monogram emblem(s) installed on the front cab doors AND LEFT REAR BODY , with "DENVER" above the monogram and "FIRE DEPT." below the monogram.

The monogram and lettering will be made of gold reflective material with black outline.

The design will be the same as on previous units.

EMBLEMS

There will be a pair of American flag emblems, installed on the rear crew cab upper windows . The emblem will be waving and made out of Gerber Vision material.

EMBLEM

There will be two (2) reflective emblem(s), approximately 12.00" - 14.00" in size, installed Cab sides.. the emblem will be modeled after the department submitted information (art, patch, etc).

EMBLEMS

There will be a quantity of two (2) emblems provided and installed on the upper body sides .

Each emblem will consist of the word "RESCUE", number "1" filled with stars, stripes and the word "DENVER", and the words "Anytime Anyplace". The emblems will be 24.00" high x 66.00" long.

EMBLEMS

There will be one emblem provided and installed REAR DOOR .

The emblem will consist of the word "RESCUE", number "1" filled with stars, stripes and the word "DENVER", and the words "Anytime Anyplace". The emblem will be 11.50" high x 32.50" long.



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Service on the chassis will include engine oil and filter change and chassis lubrication.

(one (1)) Allison Transmission service and parts manuals will be provided.

MANUAL, FIRE APPARATUS PARTS

Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

The manual will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate a part

The manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website.

The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension



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- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

There will be three (3) chassis operation manuals provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this document.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce custom chassis limited warranty certificate, WA0284, is included with this document.

ENGINE WARRANTY

A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this document.

STEERING GEAR WARRANTY

A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included with this document.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this document.



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REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this document.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor WabcoTMABS brake system limited warranty certificate, WA0232, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this document.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this document.

CAMERA SYSTEM WARRANTY

A Pierce fifty four (54) month warranty will be provided for the camera system.

COMPARTMENT LIGHT WARRANTY

The compartment lights will not offer an extended warranty.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

FIFTEEN (15) YEAR STRUCTURAL INTEGRITY

The Pierce heavy duty rescue apparatus body limited warranty certificate, WA0010, is included with this document.



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ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY

An AMDOR roll-up door limited warranty will be provided. The roll-up door will be warranted against manufacturing defects for a period of **ten (10) years**. A **five (5) year** limited warranty will be provided on painted roll up doors.

The limited warranty certificate, WA0185, is included with this document.

FIVE (5) YEAR GENERATOR WARRANTY

There will be a 5 year limited warranty provided for Onan hydraulic and Protec generators.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this document.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

The Pierce graphics fading and deterioration limited warranty limited warranty certificate, WA0168, is included with this document.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of delivery.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer will provide a cab integrity certification with this document. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:



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- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Roof Crush

The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

Additional Roof Crush

The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

Side Impact

The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact

The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact

The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420).

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.



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ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 75 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

CAB AIR CONDITIONING PERFORMANCE CERTIFICATION

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 67 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar air conditioning system has been tested and has met these criteria. The certification will be available at the time of delivery.



DENVER FIRE DEPARTMENT PIERCE HEAVY DUTY RESCUE



AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
 - The nameplate rating of the alternator.
 - The alternator rating under the conditions specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - The minimum continuous load of each component that is specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - Additional loads that, when added to the minimum continuous load, determine the total connected load.
 - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).

Exhibit A



FRONT RANGE FIRE APPARATUS

7600 Miller Court
Frederick, CO 80504
303-449-9911
1-800-334-9911
www.FrontRangeFire.com

DUANE DOUCETTE
303-304-6118
DuaneD@frontrangefire.com



PERFORM. LIKE NO OTHER.™

FOR FURNISHING FIRE APPARATUSJanuary 01, 2020City and County of Denver

The undersigned is prepared to manufacture for you, upon an order being placed by you, for final acceptance by Front Range Fire Apparatus., at its home office in Frederick, Colorado, the apparatus and equipment herein named and for the following prices:

(2) Pierce Velocity Pumpers per attached component list **\$1,221,722.00**
Delivery is approximately 9 to 10 months

Option 1: Make Chassis Pre-Payment of \$738,450.00
Due in Net 30 Days of Signed Contract **Deduct (\$22,153.00)**

Option 2: Make 100% Prepayment of \$1,183,222.00
Due in Net 30 Days of Signed Contract **Deduct (\$38,500.00)**

Total \$ _____

Said apparatus and equipment are to be built and shipped in accordance with the specifications hereto attached, delays due to strikes, war, or intentional conflict, failures to obtain chassis, materials, or other causes beyond our control not preventing, within about 9 to 10 months after receipt of this order and the acceptance thereof at our office at Frederick, Colorado, and to be delivered to you Denver, CO

The specifications herein contained shall form a part of the final contract, and are subject to changes desired by the purchaser, provided such alterations are interlined prior to the acceptance by the company of the order to purchase, and provided such alterations do not materially affect the cost of the construction of the apparatus.

The specification for fire apparatus conforms with all Federal Department of Transportation (DOT) rules and regulations in effect at the time of bid, and with all National Fire Protection Association (NFPA) Guidelines for Automotive Fire Apparatus as published at the time of bid, except as modified by customer specifications. Any increased costs incurred by first party because of future changes in or additions to said DOT or NFPA standards will be passed along to the customers as an addition to the price set forth above.

Unless accepted within 30 days from date, the right is reserved to withdraw this proposition.

FRONT RANGE FIRE APPRATUS.

By: _____
 Duane Doucette
 SALES REPRESENTATIVE





Option List

12/11/2019

Customer: Denver Fire Department
Representative Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd
Requirements Manager:
Description: Pumper, Med, Alum, Velocity - 500 Water
Body: Pumper, Short, Aluminum, 2nd Gen
Chassis: Velocity Chassis (Med Block), 2010

Bid Number: 1000
Job Number:
Number of Units: 2
Bid Date: 12/16/2019
Stock Number:
Price Level: 38 (Current: 38)
Lane:

Line	Option	Type	Option Description	Qty
1	0766611		Boiler Plates, Pumper Fire Department/Customer - Denver Fire Department Operating/In conjunction W-Service Center - Operating Miles - 25 Miles Number of Fire Dept/Municipalities - 25 Bidder/Sales Organization - Front Range Fire Apparatus Delivery - Delivery representative Dealership/Sales Organization, Service - Front Range Fire Apparatus	1
2	0661794		Single Source Compliance	1
3	0584456		Manufacture Location, Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0670275		Unit to be Similar in some Aspects, Excluding Pump Panel Fill in Blank - previous truck 33960	1
7	0610784		Comply NFPA 1901 Changes Effective Jan 1, 2016, With Exceptions	1
8	0533347		Pumper/Pumper with Aerial Device Fire Apparatus	1
9	0588611		Vehicle Certification, Pumper	1
10	0661778		Agency, Apparatus Certification, Pumper/Tanker, U.L.	1
11	0000000	STF	Inspection trip #1 - when - number of people Location - at the customer location for a preconstruction conference Qty, - 02	2
11	0000000	STF	Inspection trip #2 - when - number of people Location - at the factory for a post paint inspection Qty, - 02	2
11	0000000	STF	Inspection trip #3 - when - number of people Location - at the factory for a delivery inspection Qty, - 02	2
12	0799172		FLEET CUSTOMER	1
13	0620362		Consortium, HGAC	1
14	0537375		Unit of Measure, US Gallons	1
15	0030006		Bid Bond Not Requested	1
16	0582800		Performance Bond, 100 Percent w/25 Percent Warranty Bond, 1 Yr, and Payment Bond	1
17	0000007		Approval Drawing	1
18	0611571	SP	Drawing, As Built, At Delivery a Revised Print w/ Changes, FLEET	1
19	0087832		Drawing, Preliminary Layout, Pump Panel, Control Zone, Reference Only	1
20	0002928		Electrical Diagrams	1
21	0597598		Velocity Chassis (Med Block), 2010	1
22	0021009		Overall Length, Target Size - approximately 31' .25"	1
23	0000110		Wheelbase Wheelbase - 175.50"	1
24	0000070		GVW Rating GVW rating - 42,000 pounds	1
25	0000203		Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/DCF	1
26	0020018		Frame Liner Not Req'd	1
27	0508847		Axle, Front, Oshkosh TAK-4, Non Drive, 18,000 lb, Imp/Vel	1
28	0091744		Suspension, Front TAK-4, 18,000 lb, Qtm/AXT/Imp/Vel/DCF	1
29	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	1
30	0000322		Oil Seals, Front Axle	1
31	0582936		Tires, Front, Goodyear, G289 WHA, 315/80R22.50, 20 ply	1
32	0019575		Wheels, Front, Alcoa, 22.50" x 9.00", Aluminum, Hub Pilot	1

Line	Option	Type	Option Description	Qty
33	0000310		Request for Turning Radius Report	1
34	0530463		Axle, Rear, Meritor RS23-186, 24,000 lb Imp/Vel/Dash CF	1
35	0544253		Top Speed of Vehicle, 68 MPH	1
36	0040557		Suspen, Rear, Reyco, Spring, 27,000 lb, w/24,000 lb Axle	1
37	0000485		Oil Seals, Rear Axle	1
38	0587216		Tires, Rear, Goodyear, G622 RSD, 12R22.50, 16 ply, Single	1
39	0019625		Wheels, Rear, Alcoa, 22.50" x 8.25", Aluminum, Hub Pilot, Single	1
40	0568081		Tire Balancing, Counteract Beads	1
41	0627984		Tire Pressure Monitoring, RealWheels, AirSecure, Valve Cap, Front Tires Only	1
			Qty, Tire Pressure Ind - 2	
42	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1
43	0097571		Mud Flaps, Mounted even with Fenderetts	1
			Location - front	
			Qty, - 1	
44	0002045		Mud Flaps, w/logo front & rear	1
45	0640104	SP	Label, Informational, Crossfire System, 85 PSI	1
46	0011930		Tire, "Crossfire" Air Pressure Equalization	1
47	0031931		Valve, Extension Stabilizer System, Rear Duals	1
48	0753180	SP	Chains, Rud automatic tire, 18 strand, Eng Approval	1
49	0544802		Chocks, Wheel, SAC-44-E, Folding	1
			Qty, Pair - 01	
50	0544806		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal	1
			Qty, Pair - 01	
			Location, Wheel Chocks - Left Side Rear Tire, Forward	
51	0593760		ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010	1
52	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
53	0000730		Brakes, Meritor, Cam, Rear, 16.50 x 7.00"	1
54	0020784		Air Compressor, Brake, Cummins/Wabco 18.7 CFM	1
55	0000785		Brake Reservoirs, Three	1
56	0587033		Air Dryer, Brake, AD-9 w/heat, 2010	1
57	0000790		Brake Lines, Nylon	1
58	0000854		Air Inlet, w/Disconnect Coupling	1
			Location, Air Coupling(s) - a) DS Step Well, Rearward	
			Qty, Air Coupling (s) - 1	
59	0000860		Outlet, Air, with shut off valve	1
			Location, Air Coupling(s) - o) DS Frt Body Compt	
			Qty, Air Coupling (s) - 1	
60	0004200		Hose, Air 25' length, w/air chuck	2
			Qty, - 02	
61	0756362	SP	Air Tank, Additional for Extra Air Horn Capacity, Location	1
			Location - under the DS running board per 33960	
62	0522855		Aux Braking Systems, Simultaneous Operation	1
63	0615609		Fittings, Compression Type, Entire Apparatus, Single Rear Axle	1
64	0602848	SP	Air Line, S/S Braid, Air Governor	1
65	0795327		Engine, Cummins L9, 370 hp, 1250 lb-ft, W/OBD, EPA 2017, Imp/Vel	1
66	0001244		High Idle w/Electronic Engine, Custom	1
67	0678027		Engine Brake, Jacobs Compression Brake, Cummins Engine, with Allison Retarder	1
			Switch, Engine Brake - a) Series 60	
68	0607623	SP	Clutch, Fan, Air Actuated, Horton Drive Master, Compression Fitting	1
68	0000000	STF	Service - Oil Change and Lube, Denver	1
68	0000000	STF	Service - Oil Samples, Denver	1
69	0769181	SP	Fuel/Water Separator, Special Location, Left Side Pump House	1
70	0123135		Air Intake, w/Ember separator, Imp/Vel	1
71	0794761		Exhaust System, 4", 2017 L9 Engine, Horizontal, Right Side	1
72	0775589	SP	Exhaust, Modified 20 Degree - Approval Req'd	1
73	0787999		Radiator, Impel/Velocity	1
74	0612334	SP	Cooling Hoses, Gates Silicone, To include .25" Surge Tank	1
75	0659434	SP	Modification, Rubber Hose at Radiator, Denver	1
76	0673756		Winter Cover With Ventilation, Front Cab Grille, One Piece, Vel	1
			Color, Vinyl Cover - d) White	
77	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1

Line	Option	Type	Option Description	Qty
78	0001129		Lines, Fuel	1
79	0595087		DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	1
			Door, Material & Finish, DEF Tank - Polished Stainless	
80	0552793		Not Required, Fuel Priming Pump	1
81	0582243		Shutoff Valves, Fuel Line @ Primary Filter, Cummins	1
82	0699437		Cooler, Chassis Fuel, Not Req'd.	1
83	0642576		Trans, Allison 5th Gen, 3000 EVS PR, Imp/Vel/Dash CF	1
			Trans. retarder capacity - a. low/1000, 3000 EVS	
			Trans, retarder control - l) Auto 1/3, 2/3, 3/3	
84	0640825	SP	Transmission, Shifter, 6-Spd, Push Button w/4+2 mode, ISL9, Short Body, Denver	1
			Trans, ratio - 3000 EVS, 6Spd	
85	0797408		Transmission Oil Cooler, Modine, External, w/Modine External Sump	1
86	0539711		Label, TRANSynd Transmission Fluid Only	1
87	0522824		Mode, Downshift, Aggressive downshift to 3rd, w/engine brake, 6 speed	1
88	0683847		Fluid, 3000 Series Transmission, TES-295 TranSynd synthetic, IPOS, Custom	1
89	0001370		Driveline, Spicer 1710	1
90	0669988		Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	1
91	0001544		Not Required, Steering Assist Cylinder on Front Axle	1
92	0509230		Steering Wheel, 4 Spoke without Controls	1
93	0690274		Logo/Emblem, on Dash	1
			Text, Row (1) One - Denver	
			Text, Row (2) Two - Fire	
			Text, Row (3) Three - Department	
94	0034671		Lube System, Vogel, 22 Point, w/TAK-4 Suspension	1
			Location - in the right rear pump house area	
95	0123625		Bumper, 19" Extended, Imp/Vel	1
96	0616492		Tray, Hose, Center, 19" Bumper, Outside Air Horns, Imp/Vel	1
			Grating, Bumper extension - Grating, Rubber	
			Capacity, Bumper Tray - 09) 150' of 1.50"	
97	0626469		Cover, Aluminum Treadplate, Two (2) Flush Lift and Turn, Hose Tray, Notched	1
			Stay arm, Tray Cover - b) Pneumatic Stay Arm	
98	0510226		Lift & Tow Package, Imp/Vel, AXT, Dash CF	1
99	0002270		Tow Hooks, Chrome	1
100	0668315		Cab, Velocity FR, 7010 Raised Roof	1
101	0668309		Engine Tunnel, ISL and DD13, Impel/Velocity FR	1
102	0677478		Rear Wall, Exterior, Cab, Aluminum Treadplate	1
103	0122466		Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	1
104	0123176		Grille, Bright Finished, Front of Cab, Impel/Velocit	1
105	0002224		Scuffplates, S/S At Cab Door Jambs, 4-Door Cab	1
			Material Trim/Scuffplate - c) S/S, Polished	
106	0527032		Trim, S/S Band, Across Cab Face, Rect Lights, Velocity	1
			Material Trim/Scuffplate - b) S/S, Brushed	
			Turnsignal Covers - No Covers	
107	0087357		Molding, Chrome on Side of Cab	1
108	0559130		Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven	1
			Finish, Arm Cover - Chrome	
			Finish, Mirror Head - Chrome	
109	0667937		Door, Full Height, Velocity FR 4-Door Cab, Raised Roof	1
			Key Model, Cab Doors - 1041	
110	0655511		Door Panel, Brushed Stainless Steel, Impel/Velocit	1
111	0667905		Storage Pockets w/ Elastic Cover, Recessed, Impel/Velocit	1
112	0667902		Controls, Electric Windows, All Cab Doors, Impel/Velocit	1
113	0555485		Steps, 4-Door Full Tilt Cab, Imp/Vel	1
114	0770194		Handrail, Exterior, Knurled, Alum, 4-Door Cab	1
115	0552559		Steps, Stirrup, Cab & Crew Cab Doors, Imp/Vel	1
			Light, Step, Additional - P25 LED	
116	0509649		Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per Step	1
117	0002140		Fenders, S/S on Cab	1
118	0122479		Window, Side of C/C, Fixed, Velocity	1
119	0552935		Trim, Cab Side Windows, Velocity	1
120	0667980		Windows, (2), Front of Crew Cab, 10" Raised Roof, Impel/Velocit	1
121	0509287		Windows, Rear CC, (2) 11.25" x 18", Velocity	1

Line	Option	Type	Option Description	Qty
122	0553196		Trim, Cab Rear Windows, Velocity	1
123	0603101	SP	Cover, Wires, Power Point, Underneath Cab Location - over the power point wires, under the cab, inside the engine tunnel, passenger side rear for protection.	1
124	0748671		Cab Interior, Vinyl, Velocity FR, CARE Color, Cab Interior Vinyl/Fabric - Endure Vinyl - Silver/Gray	1
125	0667943		Cab Interior, Paint Color, Impel/Veloccity FR Color, Cab Interior Paint - a) gray	1
126	0509532		Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	1
127	0667936		Heater/defroster, Dual Zone Control, Impel/Veloccity FR	1
128	0774759	SP	Air Conditioning, Dual Zone Control, Hinge Acc Pnl, Sp Cond, Imp/Vel FR Paint Color, A/C Condenser - Cover/Mounts Match Roof	1
129	0639675		Sun Visor, Smoked Lexan, AXT, Dash CF, Imp/Vel, Saber FR/Enforcer Sun Visor Retention - No Retention	1
130	0548173		Grab Handles, Driver and Passenger Door Post, Imp/Vel	1
131	0002526		Light, Engine Compt, All Custom Chassis	1
132	0122516		Fluid Check Access, Imp/Vel	1
133	0583042		Side Roll and Frontal Impact Protection	1
134	0699999		Not Required, Frontal Impact Protection, 2010	1
135	0699998		Not Required, Side Roll Protection Package, 2010	1
136	0622617		Seating Capacity, 6 Seats	1
137	0697005		Seat, Driver, Pierce PS6, Premium, Air Ride, High Back, Safety	1
138	0696994		Seat, Officer, Pierce PS6, Premium, Air Ride, SCBA, Safety	1
139	0656795		Radio Compartment, Behind Officer Air Ride SCBA Seat, Imp/Vel	1
140	0122183		Seat, Rear Facing C/C, DS Outboard, Pierce PS6, Premium, SCBA, Safety	1
141	0102783		Not Required, Seat, Rr Facing C/C, Center	1
142	0122186		Seat, Rear Facing C/C, PS Outboard, Pierce PS6, Premium, SCBA, Safety	1
143	0108189		Not Required, Seat, Forward Facing C/C, DS Outboard	1
144	0122744		Seat, Forward Facing C/C, Center, (2) Pierce PS6, Premium, SCBA, Safety	1
145	0108190		Not Required, Seat, Forward Facing C/C, PS Outboard	1
146	0511300		Upholstery, Seats In Cab, All Imperial 1200, Pierce PS6 Color, Cab Interior Vinyl/Fabric - h) Gray/Black	1
147	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats Qty, - 05	5
148	0603867		Seat Belt, ReadyReach Seat Belt Color - Red	1
149	0604863		Seat Belt Height Adjustment, 6 Seats, Imp/Vel, Dash CF	1
150	0627014		Pick Not Required, Seat Belt Color Selected in Seat Belt Option 627339	1
151	0602464		Helmet Storage, Provided by Fire Department, NFPA 2016	1
152	0647638		Lights, Dome, Weldon Dual LED 4 Lts Color, Dome Lt - Red & White Color, Dome Lt Bzl - Grey Control, Dome Lt White - Door Switches and Lens Switch Control, Dome Lt Color - Lens Switch	1
153	0631779		Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk EX 12vdc power from - Battery switched	1
154	0650352		Spotlight, Golight Stryker, Model 30**4, LED, 2 Lts Location - one each side Color, GoLt - White Bracket, Spotlight - Pedestal - 2 Lts	1
155	0650059		Controller, Spotlight, Golight Stryker, Wired Dash Mount, 2 Lts	1
156	0621826		Location, Spotlight Controller, Driver Overhead and Officer Overhead, 2 Lts	1
156	0000000	STF	Handlights, (2) Streamlight, Fire Vulcan, 44451 C4 LED, Tail lights, 12v, Orange Location, Lights - shipped loose	1
157	0568369		Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Veloccity 2010, Dash CF	1
158	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	1
159	0543751		Light, Do Not Move Apparatus Alarm, Do Not Move Truck - No Alarm	1
160	0509042		Messages, Open Door/Do Not Move Truck, MUX w/Color Display	1
161	0611681		Switching, Cab, Membrane, Impel/Veloccity/Quantum, Dash CF, AXT WiFi MUX Location, Emerg Sw Pnls - Driver's Side Overhead	1
162	0555915		Wiper Control, 2-Speed with Intermittent, MUX, Impel/Veloccity	1

Line	Option	Type	Option Description	Qty
163	0548009		Wiring, Spare, 20 A 12V DC 1st Qty, - 01 12vdc power from - Battery direct Wire termination - Stud Location, Spare Wiring - center lower console behind panel #9 rearward	1
164	0548006		Wiring, Spare, 15 A 12V DC 2nd Qty, - 01 12vdc power from - Battery direct Wire termination - 15 amp power point plug Location - on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical with an enclosure on the inside of engine tunnel for protection - see photo.	1
165	0548004		Wiring, Spare, 15 A 12V DC 1st Qty, - 04 12vdc power from - Battery direct Wire termination - Butt Splice Location, Spare Wiring - two in the front of the cab behind panel #9 two in the rear, tucked into the forward facing seat riser	4
166	0566101		Recess, Dash Panel, Officer Side, Vel/Imp	1
167	0615386		Vehicle Information Center, 7" Color Display, Touchscreen, MUX System Of Measurement - US Customary	1
168	0606247		Vehicle Data Recorder w/CZ Display Seat Belt Monitor	1
168	0000000	STF	Intercom, David Clark Allowance for Denver Engine - 2019	1
169	0660489		Antenna Mount, Custom Chassis, Fill in Blank Mounting and Cable Locations Location - just to the rear of officer seat Qty, - 01 Location 1 - front passenger side corner of the raised roof	1
170	0653526		Camera, Pierce, Driver Mux, Rear Camera Only Camera System Audio - Not Provided	1
171	0615100		Pierce Command Zone, Advanced Electronics & Control System, Diag LEDs, Vel, WiFi	1
172	0624254		Electrical System, Velocity	1
173	0079166		Batteries, (4) Exide Grp 31, 950 CCA ea, Threaded Stud	1
174	0008621		Battery System, Single Start, All Custom Chassis	1
175	0123174		Battery Compartment, Imp/Vel	1
176	0579436		Charger, Sngl Sys, Kussmaul, 1200, 091-187-12-Remote, 40 Amp Bar Display	1
177	0012782		Location, Charger, Front Left Side Body Compartment Location, Battery Chrgr/Cmpr - High On Back Wall	1
178	0531403		Location, Bat Chrg Ind, Driver's Seat with Bracket	1
179	0016856		Shoreline, 15A 120V, Kussmaul Auto Eject, 091-55-15-120, Super Qty, - 01 Color, Kussmaul Cover - d) yellow Connection, Shoreline - the battery charger and the 6 place outlet in the crew cab	1
180	0026800		Shoreline Location Location, Shoreline(s) - DS Rear bulkhead	1
181	0608786	SP	Battery Box, Mount Kussmaul Fuse to Side of Battery Box	1
182	0529667		Cover, Protection Battery Box IO Modules	1
183	0625793		Alternator, 350 amp, Leece-Neville BLP4004H	1
184	0769064	SP	Wire Cover, Inside Pump House	1
185	0603291	SP	Open Weather Pack Connections Plugged W/Weather Pack Connectors	1
186	0695819		Sealer (Gorp), No Gorp Req'd on Elect Connections Except Fuel Sender	1
187	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - e)High Idle enable	1
188	0648716		Headlights, Rectangular Halogen, Imp/Vel	1
189	0648425		Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF Color, Lens, LED's - m)match LED's	1
190	0648256		Light, Directional, WIn M6T* LED Arrow, Recessed, Angle Bracket, Back of Cab Color, Lens, LED's - Match	1
191	0648074		Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	1
192	0768311		Light, Directional/Marker, Intermediate, Truck-Lite 30375Y Grm Mt LED 2lts	1
193	0090155		Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	1

Line	Option	Type	Option Description	Qty
194	0551870		Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir w/Flange Color, Lens - Colored	1
195	0551875		Lights, Backup, WIn M6BUW, LED	1
196	0664466		Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp Under Tailbrd Location - driver side	1
197	0589905		Alarm, Back-up Warning, PRECO 1040	1
198	0763690		Indicator, Back-up Warning, Ultrasonic 4-zone Location - next to driver	1
199	0695735		Lights, Perimeter Cab, Truck-Lite 44310C LED Cab, Perimeter Scene - Cab, 4dr Custom	1
200	0617874		Lights, Perimeter Pump House, Truck-Lite 44310C LED 2lts	1
201	0695719		Lights, Perimeter Body, Truck-Lite 44310C LED 2lts, Rear Step Control, Perimeter Lts - DS Switch Panel	1
202	0556360		Lights, Step, P25 LED 4lts, Pump Pnl Sw	1
203	0619047	SP	Rear Bulkhead Cup Switch, Stainless Steel Location, Lights - rear body bulkhead passenger side same as job #30237	1
204	0631374		Lights, Deck, WIn (2) MPPBCS Micro Pioneer LED Rear Flood Lights Control, Scene Lts - Sw Included on Light	1
205	0645676		Lights, Not Required, Hose Bed, Deck Lights At Rear	1
206	0645681		Lights, Not Required, Rear Work, Deck Lights At Rear	1
207	0645687		Lights, Rear Scene, WIn, M6ZC LED, 1st Qty, - 02 Control, Rear Scene Lts - Cab Switch Panel DS Location, Scene Lights - Rear Body Bulkhead, Low, 2lt	2
208	0771420	SP	Light, Visor, WIn, 12V PSL2* Pioneer LED Spotlt, No Bracket, Denver Qty, - 01 Location, driver's/passenger's/center - Centered Switch, Lt Control 1 DC,1 - a) DS Switch Panel Switch, Lt Control 2 DC,2 - g) PS Switch Panel Switch, Lt Control 3 DC,3 - d) No Control Switch, Lt Control 4 DC,4 - d) No Control Color, WIn Lt Housing - White Paint Light, Visor, Flash - Steady Burning	1
209	0774309		Lights, WIn, P*H2* Pioneer, 12 VDC, 1st Location - back of cab driver side Qty, - 01 Color, WIn Lt Housing - White Paint Control, Scene Lts - Pump Panel Sw DS Scene Light Optics - combination Mount, WIn II - Push Up Sd Mnt 20" Handle Holder & Sensor	1
210	0774308		Lights, WIn, P*H2* Pioneer, 12 VDC, 2nd Location - back of cab passenger side Qty, - 01 Color, WIn Lt Housing - White Paint Control, Scene Lts - Pump Panel Sw DS Scene Light Optics - combination Mount, WIn II - Push Up Sd Mnt 20" Handle Holder & Sensor	1
211	0763248		Lights, Walk Surf, Amdor AY-LB-12HW0**, LED, Cargo Areas Location - under the rear flange Qty, Cargo Lts - 1	1
212	0060101		Pumper, Short, Aluminum, 2nd Gen	1
213	0554271		Body Skirt Height, 20"	1
214	0028294		Tank, Water, 500 Gallon, Poly, Short	1
215	0003405		Overflow, 4.00" Water Tank, Poly	1
216	0028104		Foam Cell Required	1
217	0553729		Not Required, Restraint, Water Tank, Heavy Duty	1
218	0003429		Not Required, Direct Tank Fill	1
219	0003424		Not Required, Dump Valve	1
220	0048710		Not Required, Jet Assist	1
221	0030007		Not Required, Dump Valve Chute	1
222	0514778		Not Required, Switch, Tank Dump Master	1
223	0126633		Hose Bed, Aluminum, Pumper	1

Line	Option	Type	Option Description	Qty
224	0003482		Hose Bed Capacity, Additional Capacity, Hosebed - 300' X 1.75", 500' X 2.5", 500' X 2.5", 500' X 2.5", 300' X 1.75"	1
225	0003488		Divider, Hose Bed, Unpainted Qty, Hosebed Dividers - 4	4
226	0620997	SP	Hose Restraint, Hose Bed, Vinyl, 22oz, Top/Rr, Perm Frt, StayPut Fasteners Spacing Color, Vinyl Cover - b) yellow Vinyl flap weight - not weighted	1
227	0014473		Flap, Access to Fill Dome(s) Through Vinyl Hose Bed Cover Qty, - 02	2
228	0013512		Running Boards, 12.75" Deep	1
229	0689621		Tailboard, 16" Deep	1
230	0690037		Wall, Rear, Smooth Aluminum/Body Material Material, Rear Wall Inboard Facing Surfaces - Aluminum Diamondplate	1
231	0003531		Tow Bar, Under Tailboard	1
232	0077384		Bumper, Rear, Aluminum Treadplate, Raised	1
233	0003518		Morton Cass Insert in Running Boards	1
234	0003516		Morton Cass Insert in Tailboard	1
235	0003561		Construction, Compt, Alum, Pumper	1
236	0053650		LS 140" Rollup, Full Height Front & Rear	1
237	0053657		RS 140" Rollup, Low	1
238	0594005		Doors, Rollup, Amdor, Side Compartments Qty, Door Accessory - 05 Color, Roll-up Door - AMDOR Satin Aluminum Latch, Roll-up Door - Non-Locking Liftbar	5
239	0083700		Compt, Rear, Rollup, 37.75" FF, 25.88" D	1
240	0594003		Door, Amdor, Rollup, Rear Compartment Color, Roll-up Door - AMDOR Satin Aluminum Latch, Roll-up Door - Non-Locking Liftbar	1
241	0554995		No Body Modification Required	1
242	0634455		Scuffplate, Brushed S/S, Insides of Hose Bed Walls (3)	1
243	0551416		Lights, Compt, On Scene Solutions, LED & Truck-Lite Model 79384 Location - each compartment Qty, - 06	6
244	0618626	SP	Cover, Cargo Compt, Vinyl, 22 oz, Perm Front, Velcro Color, Vinyl Cover - b) yellow Qty, - 1	1
245	0687146		Shelf Tracks, Painted Qty, Shelf Track - 02 Location, Shelf Track - LS1 Upper and RS1	2
246	0600350		Shelves, Adj, 500 lb Capacity, Full Width/Depth, Predefined Locations Qty, Shelf - 03 Material Finish, Shelf - Painted - Spatter Gray Location, Shelves/Trays, Predefined - RS1-Lower Third, LS1-Upper Third and LS1-Upper Third (2nd)	3
246	0000000	STF	Oval Strapping Heron Rib - roll - RED Qty, - 1	1
247	0529812		Access Panel, Compartment Wall, 1/4 Turn Fasteners Location - in the left front compartment Size - size to fit Fill in Blank - intake relief valve	1
248	0003908		Partition, Trans Rear Compt Qty, Partition - 02 Location, Partition - c) both sides	2
249	0539177		Rub Rail, Aluminum Extruded, Side and Rear Body, Xtra Space (.50")	1
250	0784811		Fender Crowns, Rear, Stainless, w/Removable Liner Material Finish, Fender Liner - Painted	1
251	0519849		Not Required, Hose, Hard Suction	1
252	0626229		Handrails, Side Pump Panels, Per Print	1
253	0588719		Handrails, Beavertail, Full Length LS, Offset RS	1
254	0014136		Handrails, Rear, (2), (1) Above and (1) Below Hose Bed Reinforcement, Hose Bed Divider - Not Required, Reinforcement	1

Line	Option	Type	Option Description	Qty
255	0795333		Compt, Air Bottle, Single, Fender Panel, Bolt-In	4
			Qty, Air Bottle Comp - 4	
			Door Finish, Fender Compt - Polished	
			Location, Fender Compt - Single - LS Fwd, Single - LS Rear, Single - RS	
			Fwd and Single - RS Rear	
			Latch, Air Bottle Compt - Flush Lift & Turn	
			Insert, Air Bottle Compt - Rubber Matting	
256	0045527		Horizontal Mounting Tracks for Air Bottle Holders	1
			Location, Bracket/comp. - LS2	
			Qty, - 1	
			qty, Mounting Studs - 03	
256	0000000	STF	Ladder, 24' Duo-Safety 900A 2-Sect, Provided By FRFA	1
256	0000000	STF	Ladder, 14' Duo-Safety 775A Roof, Provided By FRFA	1
257	0004300		Brackets, Adjustable, RS	1
258	0602897		Ladder, 10' Alco-Lite Folding FL-10, Provided by Dealer, Pumper NFPA 2016,Class	1
			Location, Folding Ladder - Above Ladders	
259	0055949		Trough, S/S, Backboard Storage, Behind Ladder Storage	1
260	0554061		Pike Pole, 10' DUO Safety, Fiberglass, Pumper NFPA Classification	1
			Qty, Pike Poles - 1	
			Location - on driver side compartment top	
261	0789537		Pike Pole, 6' DUO Safety, Fiberglass	1
			Qty, Pike Poles - 1	
			Location, Pike Pole - Catwalk - PS	
262	0004360		Tulip Clip Holders For Pike Poles, Pierce Furnished Pike Poles	1
			Location - over the left and right compartments - no rubber coating on	
			clips, inboard as far as possible	
263	0004380		Steps, Folding, Front of Body, One Each Side, Eberhard	1
264	0004381		Steps, Corner, Rear of Body	1
265	0004390		Step, Folding - Extra, Body Only, Eberhard	2
			Qty, Folding Step - 02	
			Location, Additional Step - driver side front bulkhead	
266	0004425		Pump, Waterous, CSU, 1500 GPM, Single Stage	1
267	0004482		Seal, Mechanical, Waterous	1
268	0559769		Trans, Pump, Waterous C20 Series	1
269	0635600		Pumping Mode, Stationary Only	1
270	0605126		Pump Shift, Air w/Manual Override, Split Shaft, Interlocked, Waterous	1
271	0003148		Transmission Lock-up, EVS	1
272	0004547		Auxiliary Cooling System	1
273	0014486		Not Required, Transfer Valve, Stage Pump	1
274	0004513		Valve, Relief Intake, Waterous, Pressure Feature	1
			Pressure Setting - 125 psig	
275	0546803		Controller, Pressure, Class 1 Total Pressure Governor (TPG)	1
276	0673872		Primer, Trident, Air Prime, Air Operated, Automatic	1
277	0528229		Drain Locations, Special Instructions	1
278	0658368		Thermal Relief Valve, OPM, w/Red Warning Light, Waterous Pump	1
			Location, Thermal Relief Discharge - Ground	
279	0780364		Manuals, Pump, (2) Total, Electronic Copies	1
280	0602512		Plumbing, Stainless Steel and Hose, Single Stage Pump, Control Zone	1
281	0795135		Plumbing, Stainless Steel, w/Foam System	1
282	0004645		Inlets, 6.00" - 1250 GPM or Larger Pump	1
283	0004646		Cap, Main Pump Inlet, Long Handle, NST, VLH	1
283	0000000	STF	Valve, Ball Intake Relief, Akron Revolution, Provided By FRFA	2
			Location - right and left side	
			Qty - 2	
			Connection, Inlet, Side B - 5.0" Storz with a cap	
			Connection, Outlet, Side A - 6.0" FNST swivel long handle	
			Ball Intake Valve - 7982 (30 degree swivel inlet)	
284	0014650		Pump Suction Tube(s), Short, All	1
285	0024615		Valves, Full Flow Waterous Side with Akron 8000 Series Valve	3
			Qty, Valves - 3	
286	0004660		Inlet, Left Side, 2.50"	1
287	0004680		Inlet, Right Side, 2.50"	1

Line	Option	Type	Option Description	Qty
288	0016158		Valve, Inlet(s) Recessed, Side Cntrl, "Control Zone"	2
			Qty, Inlets - 2	
289	0004700		Control, Inlet, at Valve	1
290	0092569		No Rear Inlet (Large Dia) Requested	1
291	0092696		Not Required, Cap, Rear Inlet	1
292	0064116		No Rear Inlet Actuation Required	1
293	0009648		No Rear Intake Relief Valve Required on Rear Inlet	1
294	0092568		No Rear Auxiliary Inlet Requested	1
295	0563738		Valve, .75" Bleeder, Aux. Side Inlet, Swing Handle	1
296	0029043		Tank to Pump, (1) 3.00" Valve, 3.00" Plumbing	1
297	0004905		Outlet, Tank Fill, 1.50"	1
298	0004940		Outlet, Left Side, 2.50"	1
			Qty, Discharges - 01	
299	0092570		Not Required, Outlets, Left Side Additional	1
300	0004945		Outlet, Right Side, 2.50"	2
			Qty, Discharges - 02	
301	0092571		Not Required, Outlets, Right Side Additional	1
302	0008731		Outlet, 5" w/4" Right, Handwheel	1
			Valve, Brand - Akron	
303	0648906		Outlet, Front, 2.50" w/2.50" Plumbing	1
			Fitting, Outlet - 2.50" NST with 90 degree swivel	
			Drain, Front Outlet - Automatic	
			Location, Front, Single - top of right bumper	
304	0092575		Not Required, Outlet, Rear	1
305	0044930		Outlet, Rear, 2.50", Additional	2
			Location - Location will be one left and right side	
			Qty, Discharges - 02	
306	0620203	SP	Outlet, Front HB, 1.50" w/2.00" Plumbing, NPSH Thread	2
			Qty, Discharges - 02	
			Location, Outlet - c) one (1) each side	
307	0752097		Caps/Plugs for 1.00" to 3.00" Discharges/Inlets, Chain	1
308	0563739		Valve, 0.75" Bleeder, Discharges, Swing Handle	1
309	0005091		Elbow, Left Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
310	0035094		Not Required, Elbow, Left Side Outlets, Additional	1
311	0025091		Elbow, Right Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
312	0089584		Not Required, Elbow, Right Side Outlets, Additional	1
313	0045099		Not Required, Elbow, Rear Outlets	1
314	0076593		Elbow, Rear Outlets, 45 Degree, 2.50" FNST x 2.5" MNST, VLH, Additional	1
315	0005099		Elbow, Large Dia Outlet, 30 Deg, 5.00" FNST x 5.00" Storz	1
316	0039313		Adapter, Thread - 5" Storz X 2.50" MNST & Cap	1
			Qty, Adapter for Outlets - 01	
			Location, Adapter(s) - passenger side large diameter	
317	0062133		Control, Outlets, Manual, Pierce HW if applicable	1
318	0005065		Outlet, 3.00" Deluge Riser	1
318	0000000	STF	Akron 3423 Deluge, 5160 Nozzle, 3505 Bracket, 3501 Cover, Denver Engines	1
319	0029302		No Monitor Requested	1
320	0029304		No Nozzle Req'd	1
321	0005070		Deluge Mount, NPT	1
322	0025140		Not Required, 1.50" Crosslays	1
323	0029199		Crosslays Sngl Sheet Unpainted, (2+) 2.50" Std Cap	2
			Qty, Crosslays - 2	
324	0029260		Not Required, Speedlays	1
325	0591145		Hose Restraint, Crosslay/Deadlay, Top and Ends, Elastic Netting	2
			Qty, - 02	
326	0750536		Hose Restr, Spdly, Not Required, No Spdly	1
327	0015180		Roller, Horizl/Vertical, (2) Crosslays	1
328	0005248		Reel, Booster - Rear Compt., Steel, Roll-up Door	1
			Finish, Reel - Painted Gray	
329	0005279		Switch, Reel Rewind - One at Reel	1
330	0010925		Hose, Booster - 200' of 1.00"/800 PSI(100'+50'+50')	1
331	0005244		Capacity, Hose Reel 200' of 1"	1
332	0007428		Nozzle for Booster Reel Not Req'd	1

Line	Option	Type	Option Description	Qty
333	0005326		Blowout, Hose Reel - Valve at Panel	1
			Qty, - 1	
334	0015412		Foam Sys, Akron Eductor 3126-125 (Single Agent)	1
			Discharge - front crosslay	
335	0012126		Not Required, CAF Compressor	1
336	0552517		Not Required, Refill, Foam Tank	1
337	0649000		Cover, Foam Tank Dome, Hinge Location	1
			Location - forward edge of the fill dome	
338	0028553		Tag, Foam Tank	1
339	0031896		Demonstration, Foam System, Dealer Provided	1
340	0005447		Foam Cell, 30 Gallon, Not Reduce Water	1
			Type of Foam - Class "B"	
341	0091036		Drain, 1.00" Foam Tank #1	1
342	0091079		Not Required, Foam Tank #2	1
343	0091112		Not Required, Foam Tank #2 Drain	1
344	0007575		Pump House, Side Control, 48", Control Zone	1
345	0594577		Pump Panel Configuration, Match Previous Unit, as Close as Possible	1
			Fill in Blank - 33960	
346	0005525		Material, Pump Panels, Side Control Brushed Stainless	1
347	0005577		Panel, Pump Access - Right Side and Front	1
348	0035501		Pump House Structure, Std Height	1
349	0005945		Light, Pump Compt	1
350	0586438		Gauges, Engine - Pump Panel, IAT Pressure Controller	1
351	0005601		Throttle Included w/ Pressure Controller	1
352	0549333		Indicators, Engine, Included with Pressure Controller	1
353	0745568		Indicator Light, Pump Panel, Ok To Pump, Green	1
354	0748773	SP	Compt, RS Pump Panel	1
355	0001493		Tag, Special Wording, Discharge	2
			Qty, - 02	
			Discharge - Passenger side rear 2.50" discharge & Driver side rear 2.50" discharge	
			Wording, Discharge - Passenger side rear 2.50" discharge & Driver side rear 2.50" discharge	
356	0001750		Tag, Special Colors	3
			Qty, Gauges/Disc. - 03	
			Color, Discharge Tag - Passenger Rear 1.5" Preconnect = Aqua, Driver Rear 1.5" Preconnect = Light Green, Large Diameter Side Discharge = Blue	
357	0044860		Test Port, Electronic, Pump RPM, Watrous Pump	1
358	0005690		Gauges, 6.00" Master, Class 1, 30"-0-600psi	1
359	0005715		Gauge, 3.50" Pressure, Class 1, 30"-0-600psi	1
360	0683969		Gauge, Water Level, IC, 14-LED, PN 3030385-01	1
361	0683947		Gauge, Foam Level, Innovative Controls, 14-LED PN 3030386-01B, Class B Foam	1
362	0679660		Light Shield, S/S, On Scene Solutions Night Axe, LED	1
363	0606697		Air Horns, (2) Grover, In Bumper	1
364	0606834		Location, Air Horns, Bumper, Each Side, Outside Frame, Inboard (Pos #2 & #6)	1
365	0006064		Control, Air Horn, DS & PS Foot Sw	1
366	0006100		No Electronic Siren	1
367	0046133		No Siren Location	1
368	0076155		No Siren Switch	1
369	0006188		No Speaker	1
370	0550461		Location, Not Required, No Speaker (Q2B)	1
371	0016080		Siren, Federal Q2B	1
372	0006095		Siren, Mechanical, Mounted Above Deckplate	1
			Location, Siren, Mech - a) Left	
373	0026160		Control, Mech Siren, Horn Ring, PS Foot Sw	1
374	0642299		Grounding Strap, Q2B Siren Motor to Ground Stud	1
375	0603446	SP	Lightbar, WIn, Freedom IV-Q, 92", RRR_WR_RWOptWR_RW_RRR	1
			Opticom Priority - b) High	
			Opticom Activation - Cab Switch & E-Master	
			Momentary Opticom Activation - No Activation	
			Filter, Whl Freedom Ltbrs - No Filters	

Line	Option	Type	Option Description	Qty
376	0540451		Light, Front Zone, WIn M6* LED, Colored Lens, 4lts Q Bezel Color, Lt DS Frnt Outside - DS Front Outside Red Color, Lt PS Frnt Outside - PS Front Outside Red Color, Lt DS Front Inside - w) DS Front Inside White Color, Lt PS Front Inside - w) PS Front Inside White	1
377	0653937		Flasher, Headlight Alternating Headlt flash deactivation - b)w/any head lights	1
378	0747228		Lights, Side Zone Lower, WIn M6**, M6**, M6**, 6Lts Location, Lights Front Side - b)each side bumper Color, Lens, LED's - Colored Location, Lights Mid Side - Rearward of Crew Cab Doors Location, Lights Rear Side - Over Rear Wheels Color, Trim - Chrome Trim Color, Lt Side Front, DS - Red Color, Lt Side Front, PS - Red Color, Lt Side Mid DS - Blue Color, Lt Side Mid PS - Blue Color, Lt Side Rear PS - Red Color, Lt Side Rear DS - Red	1
379	0634517		Lights, Side, WIn M6* LED w/45 Degree Bezel, Cab Corner, pair Qty, Lights, Pair - 1 Control, Light - b) side warning Color,WhIn Sup600 LED - a) rd/rd Material, Bracket - Polished S/S	1
380	0540777		Lights, Rear Zone Lower, WIn M6* LED, Colored Lens Color, Lt DS Rear - r) DS Rear Lt Red Color, Lt PS Rear - b) PS Rear Lt Blue	1
381	0680854		Light, Rear Zone Upper, WIn B6M7**1P, Super LED Beacon w/M7 LED Lt Color, Lights, Warning - c) amber Color, Dome, Rear Warning - b)both domes red Control, Light - a) rear upper warning Color, Lens, LED's - m)match LED's	1
382	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
383	0016610		Mtg, Rear Warn Lts, Std Mount, S/S Brkts	1
384	0762435		Light, Traffic Directing, WIn TAL85, 46.87" Long LED, Lens Feature Activation, Traffic Dir L - Not Connected Color, Lens, LED's - m)match LED's	1
385	0551728		Location, Traf Dir Lt, Recessed with S/S Trim	1
386	0530288		Location, Traf Dir Lt Controller, Overhead Recessed Console, above Eng Tnl DS	1
387	0076826		Cup Holder for Telescopic - Pushup - Light Pole Qty, 120/240 Volt Light - 2	2
388	0780350		Receptacle Strip, 15A 120V 6-Place, Interior Cab Qty, - 1 Location 1 - 120 volt receptacle that the power stripe plugs into will be located behind the drive seat recessed in side wall, power stripe will be ran thru the crew cab floor rear od engine tunnel and coiled loose with final install by the Customer - see photo AC Power Source - Shoreline	1
389	0519934		Not Required, Brand, Hydraulic Tool System	1
390	0007150		Bag of Nuts and Bolts Qty, Bag Nuts and Bolts - 1	1
391	0602516		NFPA Required Loose Equipment, Pumper, NFPA 2016, Provided by Fire Department	1
392	0602407		Soft Suction Hose, Provided by Fire Department, Pumper NFPA 2016 Classification	1
393	0027023		No Strainer Required	1
394	0602538		Extinguisher, Dry Chemical, Pumper NFPA 2016 Class, Provided by Fire Department	1
395	0602360		Extinguisher, 2.5 Gal. Pressurized Water, Pumper NFPA 2016, Provided by Fire Dept	1
396	0602679		Axe, Flathead, Pumper NFPA 2016 Classification, Provided by Fire Department	1
397	0602667		Axe, Pickhead, Pumper NFPA 2016 Classification, Provided by Fire Department	1
398	0559573		Paint, Single Color, Custom Paint Color, Predefined - #20 White	1
399	0636525		Coating, Chassis Frame Assy, Hot Dip Galvanized Paint Color, Frame Assembly, Predefined - Gloss Black	1

Line	Option	Type	Option Description	Qty
400	0693797		No Paint Required, Aluminum Front Wheels	1
401	0693792		No Paint Required, Aluminum Rear Wheels	1
402	0788021		Coating, Hot Dip Galvanized, Water Tank Cradle, Pumper, Tankers	1
403	0007230		Compartment, Painted, Spatter Gray	1
404	0544129		Reflective Band, 1"-6"-1"	1
			Color, Reflect Band - A - e) black	
			Color, Reflect Band - B - t) gold	
			Color, Reflect Band - C - za) black	
405	0510041		Reflective across Cab Face, Imp/Vel	1
406	0536954		Stripe, Chevron, Rear, Diamond Grade, Pumper	1
			Color, Rear Chevron DG - fluorescent yellow green	
407	0027341		Jog, In Reflective Stripe, Single or Multiple	1
			Qty, - 1	
408	0515348		Stripe, Black Outline, Scotchlite on Reflective Band	1
			Qty, - 1	
409	0509398		Stripe, Reflective, Chevron, Cab and Crew Cab Doors Interior	1
			Color, Reflect Band - B - t) gold	
			Size, Chevron Striping - 04	
			Color, Reflect Chev - A - e) black	
410	0033179		Lettering Specifications, Reflective	1
411	0686159		Lettering, Reflective, 3.00", (41-60)	1
			Outline, Lettering - Outline	
412	0515269		Lettering, Reflective 2" Script w/outline	1
			Color, Lettering - e) black	
413	0041534		Emblem, (3) Letter Monogram Style with Lettering, Reflective, Denver, Each	2
			Qty, - 02	
			Location, Emblem - on the front cab doors	
			Color, Reflective - i) gold	
414	0522815		Emblem, American Flag, Waving, Gerber Vision, Pair	1
			Location, Emblem - on the rear crew cab windows	
415	0666414		Emblem, Freedom Flag, Each	1
			Qty, - 01	
			Location, Emblem - R1	
			Size, Flag - 24" - 25"	
416	0032773		Manuals, Two (2), Fire Apparatus Parts, & (1) CD, Custom Chassis	1
417	0002905		Manuals, (2) Chassis Service, Custom	1
418	0032433		Manuals, Two (2) Chassis Operation, Custom	1
418	0000000	STF	Cummins Trouble Shooting and Parts Manuals, Denver	1
418	0000000	STF	Allison Transmission Service & Parts Manual, Denver	1
419	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
420	0611136		Warranty, Chassis, 3 Year, Velocity/Impel, WA0284	1
421	0696698		Warranty, Engine, Cummins, 5 Year, WA0181	1
422	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
423	0595767		Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	1
424	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
425	0777368		Warranty, Axle, 2 Year, Meritor, General Service, WA0328	1
426	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
427	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
428	0595813		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
429	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
430	0695416		Warranty, Pierce Camera System, WA0188	1
431	0708760		Warranty, Not Applicable, LED Strip Lights	1
432	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
433	0685945		Warranty, Transmission Cooler, WA0216	1
434	0688798		Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	1
435	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
436	0690936		Warranty, Roll up Doors, Not Required	1
437	0063510		Warranty, Pump, Waterous, 5 Year Parts, WA0225	1
438	0648675		Warranty, 10 Year S/S Pumbing, WA0035	1
439	0641372		Warranty, Foam System, Not Available	1
440	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
441	0595412		Warranty, Graphics Lamination, 1 Year, Apparatus, WA0168	1

Line	Option	Type	Option Description	Qty
442	0683627		Certification, Vehicle Stability, CD0156	1
443	0608290		Certification, Engine Installation, Imp/Vel, Cummins L9, 2017, CD0152/CD0159	1
444	0686786		Certification, Power Steering, CD0098	1
445	0667417		Certification, Cab Integrity, Velocity FR, CD0009	1
446	0548950		Certification, Cab Door Durability, Velocity/Impel, CD0001	1
447	0548967		Certification, Windshield Wiper Durability, Impel/Velocit, CD0005	1
448	0667411		Certification, Electric Window Durability, Velocity/Impel FR, CD0004	1
449	0549273		Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	1
450	0667416		Certification, Cab Heater and Defroster, Velocity/Impel FR, CD0015	1
451	0667415		Certification, Cab Air Conditioning Performance, Velocity/Impel FR, CD0016	1
452	0545073		Amp Draw Report, NFPA Current Edition	1
453	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
454	0799248		Appleton/Florida BTO	1
455	0000018		PUMPER, 2ND GEN	1
456	0000012		PIERCE CHASSIS	1
457	0004713		ENGINE, OTHER	1
458	0046395		EVS 3000 Series TRANSMISSION	1
459	0020011		WATEROUS PUMP	1
460	0020009		POLY TANK	1
461	0028087		EDUCTOR FOAM SYSTEM	1
462	0020006		SIDE CONTROL	1
463	0020007		AKRON VALVES	1
464	0020015		ABS SYSTEM	1
465	0658751		PUMPER BASE	1

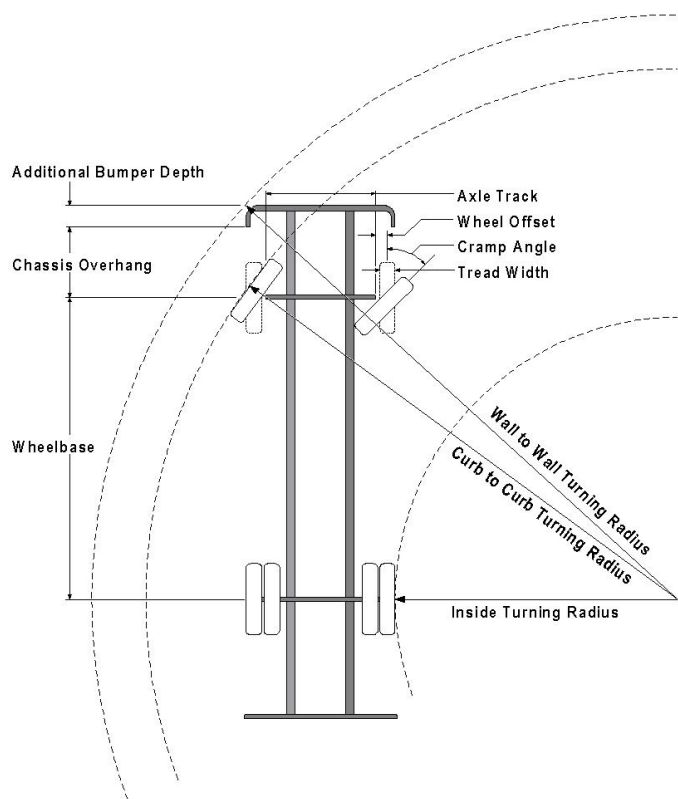


Turning Performance Analysis

12/11/2019

Bid Number: 1000
Department: Denver Fire Department

Chassis: Velocity Chassis (Med Block), 2010
Body: Pumper, Short, Aluminum, 2nd Gen



Parameters:

*Inside Cramp Angle:	45°
Axle Track:	86.17 in.
Wheel Offset:	3.12 in.
Tread Width:	12.4 in.
Chassis Overhang:	78 in.
Additional Bumper Depth:	19 in.
Front Overhang:	97 in.
Wheelbase:	175.5 in.

Calculated Turning Radii:

Inside Turn:	13 ft. 10 in.
Curb to curb:	27 ft. 0 in.
Wall to wall:	32 ft. 0 in.

Category	Option	Description
Axle, Front, Custom	0508847	Axle, Front, Oshkosh TAK-4, Non Drive, 18,000 lb, Imp/Vel
Wheels, Front	0019575	Wheels, Front, Alcoa, 22.50" x 9.00", Aluminum, Hub Pilot
Tires, Front	0582936	Tires, Front, Goodyear, G289 WHA, 315/80R22.50, 20 ply
Bumpers	0123625	Bumper, 19" Extended, Imp/Vel

Notes:

*Actual Inside cramp angle may be less than shown.

Curb to Curb turning radius calculated for 9.00 inch curb.

Definitions:

Inside CrampAngle	Maximum turning angle of the front inside fire.
Axle Track	King-pin to King-pin distance of front axle.
Wheel Offset	Offset from the center line of the wheel to the King-pin.
Tread Width	Width of the tire tread.
Chassis Overhang	Distance of the center line of the front axle to the front edge of the cab. This does not include the bumper depth.
Additional Bumper Wheel	Depth that the bumper assembly adds to the front overhang.
Wheelbase	Distance between the center lines of the vehicles front and rear axles.
Inside Turning Radius	Radius of the smallest circle around which the vehicle can turn.
Curb to Curb Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures assumes a curb height of 9 inches.
Wall to Wall Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures takes into account any front overhang due to chassis , bumper extensions and or aerial devices.



Electrical Analysis

12/11/2019

Bid #: 1000**Job #:****Desc:** Pumper, Med, Alum, Velocity - 500 Water**Sales Rep:** Doucette, Duane**Customer:** Denver Fire Department**Organization:** Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0000000	Handlights, (2) Streamlight, Fire Vulcan, 44451 C4 LED, Tail lights,		0.00	1.00	0.00
0001244	High Idle w/Electronic Engine, Custom		0.00	1.20	0.00
0002526	Light, Engine Compt, All Custom Chassis		0.00	1.60	0.00
0005248	Reel, Booster - Rear Compt., Steel, Roll-up Door		0.00	36.00	0.00
0005945	Light, Pump Compt		0.00	1.80	0.00
0006064	Control, Air Horn, DS & PS Foot Sw		0.00	0.83	0.00
0016080	Siren, Federal Q2B		0.00	100.00	0.00
0044860	Test Port, Electronic, Pump RPM, Waterous Pump		0.00	0.00	0.08
0079166	Batteries, (4) Exide Grp 31, 950 CCA ea, Threaded Stud		0.00	3.00	0.00
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel		0.00	180.00	0.00
0543751	Light, Do Not Move Apparatus		0.00	0.80	0.00
0548004	Wiring, Spare, 15 A 12V DC 1st		0.00	0.00	60.00
0548006	Wiring, Spare, 15 A 12V DC 2nd		0.00	0.00	15.00
0548009	Wiring, Spare, 20 A 12V DC 1st		0.00	0.00	20.00
0549333	Indicators, Engine, Included with Pressure Controller		0.00	0.35	0.00
0551875	Lights, Backup, WIn M6BUW, LED		0.00	3.20	0.00
0559130	Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven		0.00	0.00	5.60
0589905	Alarm, Back-up Warning, PRECO 1040		0.00	0.50	0.00
0593760	ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010		0.00	6.00	0.00
0631779	Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk		0.00	0.74	0.00
0634517	Lights, Side, WIn M6* LED w/45 Degree Bezel, Cab Corner, pair		0.00	2.70	1.80
0645687	Lights, Rear Scene, WIn, M6ZC LED, 1st		0.00	0.00	4.00
0650352	Spotlight, Golight Stryker, Model 30**4, LED, 2 Lts		0.00	0.00	3.00
0653526	Camera, Pierce, Driver Mux, Rear Camera Only		0.00	1.20	0.00
0653937	Flasher, Headlight Alternating		0.00	0.00	0.08
0667902	Controls, Electric Windows, All Cab Doors, Impel/Veloccity FR		0.00	26.00	0.00
0667936	Heater/defroster, Dual Zone Control, Impel/Veloccity FR		0.00	0.00	12.10
0673872	Primer, Trident, Air Prime, Air Operated, Automatic		0.00	0.01	0.00
0678027	Engine Brake, Jacobs Compression Brake, Cummins Engine, with		0.00	0.42	0.00
0748773	Compt, RS Pump Panel		0.00	0.00	1.00
0763248	Lights, Walk Surf, Amdor AY-LB-12HW0**, LED, Cargo Areas		0.00	0.00	0.00
0769181	Fuel/Water Separator, Special Location, Left Side Pump House		0.00	0.00	15.62
0771420	Light, Visor, WIn, 12V PSL2* Pioneer LED Spotlt, No Bracket, Denver		0.00	0.00	6.00
0774308	Lights, WIn, P*H2* Pioneer, 12 VDC, 2nd		0.00	0.00	13.00
0774309	Lights, WIn, P*H2* Pioneer, 12 VDC, 1st		0.00	0.00	13.00
0774759	Air Conditioning, Dual Zone Control, Hinge Acc Pnl, Sp Cond, Imp/Vel	LM	0.00	0.00	96.50
0002758	Amp Draw, NFPA/ULC Radio Allowance	NFPA	5.00	0.00	0.00
0053650	LS 140" Rollup, Full Height Front & Rear	NFPA	1.10	0.00	1.10
0053657	RS 140" Rollup, Low	NFPA	1.80	0.00	1.80
0083700	Compt, Rear, Rollup, 37.75" FF, 25.88" D	NFPA	0.90	0.00	0.90
0090155	Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	NFPA	0.50	0.00	0.00
0092582	Load Manager/Sequencer, MUX	NFPA	0.56	0.56	0.00
0509649	Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per	NFPA	1.00	0.00	0.00
0540451	Light, Front Zone, WIn M6* LED, Colored Lens, 4lts Q Bezel	NFPA	1.80	5.40	1.80
0540777	Lights, Rear Zone Lower, WIn M6* LED, Colored Lens	NFPA	1.80	2.70	0.00
0546803	Controller, Pressure, Class 1 Total Pressure Governor (TPG)	NFPA	1.70	0.00	0.00
0551870	Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir	NFPA	0.83	2.49	0.00
0552559	Steps, Stirrup, Cab & Crew Cab Doors, Imp/Vel	NFPA	0.20	0.00	0.00
0555915	Wiper Control, 2-Speed with Intermittent, MUX, Impel/Veloccity	NFPA	2.10	8.40	0.00
0556360	Lights, Step, P25 LED 4lts, Pump Pnl Sw	NFPA	1.00	0.00	0.00

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

12/11/2019

Bid #: 1000**Job #:****Desc:** Pumper, Med, Alum, Velocity - 500 Water**Sales Rep:** Doucette, Duane**Customer:** Denver Fire Department**Organization:** Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Veloccity 2010,	NFPA	1.26	0.00	0.00
0586438	Gauges, Engine - Pump Panel, IAT Pressure Controller	NFPA	0.30	0.00	0.00
0587033	Air Dryer, Brake, AD-9 w/heat, 2010	NFPA	4.70	0.00	0.00
0595087	DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	NFPA	0.60	11.40	0.00
0603446	Lightbar, WIn, Freedom IV-Q, 92", RRR_WR_RWOptWR_RW_RRR	NFPA	6.48	5.16	7.44
0605126	Pump Shift, Air w/Manual Override, Split Shaft, Interlocked, Waterous	NFPA	1.00	0.00	0.00
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	NFPA	1.20	0.00	0.00
0617874	Lights, Perimeter Pump House, Truck-Lite 44310C LED 2lts	NFPA	1.00	0.00	0.00
0631374	Lights, Deck, WIn (2) MPPBCS Micro Pioneer LED Rear Flood Lights	NFPA	6.70	0.00	0.00
0642576	Trans, Allison 5th Gen, 3000 EVS PR, Imp/Vel/Dash CF	NFPA	2.00	2.00	0.00
0647638	Lights, Dome, Weldon Dual LED 4 Lts	NFPA	0.80	0.80	0.00
0648074	Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	NFPA	0.49	0.00	0.00
0648256	Light, Directional, WIn M6T* LED Arrow, Recessed, Angle Bracket,	NFPA	1.80	2.70	0.00
0648425	Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF	NFPA	0.70	0.70	0.00
0648716	Headlights, Rectangular Halogen, Imp/Vel	NFPA	5.46	7.82	0.00
0664466	Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp	NFPA	0.69	0.00	0.00
0668315	Cab, Velocity FR, 7010 Raised Roof	NFPA	6.80	10.20	0.00
0679660	Light Shield, S/S, On Scene Solutions Night Axe, LED	NFPA	2.00	0.00	0.00
0680854	Light, Rear Zone Upper, WIn B6M7**1P, Super LED Beacon w/M7	NFPA	6.00	0.00	0.00
0683947	Gauge, Foam Level, Innovative Controls, 14-LED PN 3030386-01B,	NFPA	0.15	0.00	0.00
0683969	Gauge, Water Level, IC, 14-LED, PN 3030385-01	NFPA	0.15	0.00	0.00
0695719	Lights, Perimeter Body, Truck-Lite 44310C LED 2lts, Rear Step	NFPA	0.50	0.00	0.00
0695735	Lights, Perimeter Cab, Truck-Lite 44310C LED	NFPA	1.08	0.00	0.00
0745568	Indicator Light, Pump Panel, Ok To Pump, Green	NFPA	0.10	0.00	0.00
0747228	Lights, Side Zone Lower, WIn M6**, M6**, M6**, 6Lts	NFPA	5.40	8.10	0.00
0762435	Light, Traffic Directing, WIn TAL85, 46.87" Long LED, Lens Feature	NFPA	2.52	2.52	0.00
0768311	Light, Directional/Marker, Intermediate, Truck-Lite 30375Y Grm Mt	NFPA	0.10	1.00	0.00
0795327	Engine, Cummins L9, 370 hp, 1250 lb-ft, W/OBD, EPA 2017, Imp/Vel	NFPA	1.00	0.00	0.00
0625793	Alternator, 350 amp, Leece-Neville BLP4004H	S	0.00	0.00	0.00
Load Totals:			81.27	439.30	279.82

Note: Minimum Continuous Load is in "Blocking Right of Way" mode.(Reference current edition of NFPA 1901)

Note: Intermittent Load items are not factored in on any alternator load comparisons. These items are included on the report for reference only and should be looked at as amp draw exclusion items. (Reference current edition of NFPA 1901)

Note: Total Connected Load "Demand" represents Total Connected Load minus any Load Managed items

Alternator Output at Idle: 210.00

Minimum Continuous Load	
Supply:	210.00
Demand:	81.27
Variance:	128.73

Alternator Output at Governed Speed: 291.00

Total Connected Load	
Supply:	291.00
Demand:	264.59
Variance:	26.41

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



DENVER FIRE DEPARTMENT
PIERCE TRIPLE COMBINATION PUMPER



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DENVER FIRE DEPARTMENT PIERCE TRIPLE COMBINATION PUMPER



Front Range Fire Apparatus is pleased to submit to Denver Fire Department for a **Pierce® triple combination pumper** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment. This document will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

PIERCE MANUFACTURING was founded in 1913. Since then we have been building bodies with one philosophy, "BUILD THE FINEST". Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 75 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 62,500 apparatus, including more than 33,900 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 870,000 total square feet of floor space situated on approximately 105 acres of land. Our Bradenton, Florida facility has 300,000 square feet of floor space situated on approximately 38 acres of land.

Our beliefs in high ethical standards are carried through in all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current edition of NFPA 1901 standards, this document will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this document are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.



DENVER FIRE DEPARTMENT PIERCE TRIPLE COMBINATION PUMPER



QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society B2.1-2000 requirements for structural welding of sheet metal. Our flux core arc welding uses alloy rods, type 7000 and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs and American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that are established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance is included with this document.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to insure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least twenty five (25) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for



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personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Front Range Fire Apparatus by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within twenty five (25) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of \$5,000,000 in parts dedicated to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations. You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus. Published component catalogs, which include proprietary systems along with an extensive operators manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVTs, and offers hands-on repair and maintenance training classes multiple times a year.



DENVER FIRE DEPARTMENT PIERCE TRIPLE COMBINATION PUMPER



LIABILITY

The successful bidder will defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

INSURANCE PROVIDED BY BIDDER

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence \$1,000,000

Products/Completed Operations Aggregate \$1,000,000

Personal and Advertising Injury \$1,000,000

General Aggregate \$2,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form and will include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy will include Owner as an additional insured when required by written contract.

COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

The successful bidder will, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile liability insurance and coverage will be written on a Commercial Automobile liability form:

Each Accident Combined Single Limit: \$1,000,000

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate: \$3,000,000

Each Occurrence: \$3,000,000

The umbrella policy will be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile Liability policies.



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The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of Product Liability insurance:

Each Occurrence \$1,000,000

Products/Completed Operations Aggregate \$1,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form. The manufacturer's policy will include the owner as additional insured when required by written contract between the Owner and a Pierce authorized dealer.

UMBRELLA/EXCESS LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Each Occurrence: \$25,000,000

Aggregate: \$25,000,000

The umbrella policy will be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products policies.



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The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Manufacturer agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as the certificate holder.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pumphouse (including the sheet metal enclosure, valve controls, piping and operators panel) and body will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

SPECIAL INSTRUCTIONS

The apparatus will be designed and built to match the previous truck 33960. However, some variation may be necessary due to changes in our manufacturing processes or our product offering. Revisions in NFPA guidelines and/or other regulations may also affect our ability to match the previous unit.

NFPA 2016 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.



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All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the customer approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the document as "non-NFPA".

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

PUMP TEST

Underwriters Laboratory (UL) will test, approved, and certify the pump. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the pump manufacturer's record of pump construction details will be forwarded to the Fire Department.

GENERATOR TEST

If the unit has a generator, Underwriters Laboratory (UL) will test, approved, and certify the generator. The test results will be provided to the Fire Department at the time of delivery.



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BREATHING AIR TEST

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and have the sample certified that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

INSPECTION TRIP #1

An inspection trip will be provided for two (2) people. Trip will take place at the customer location for a preconstruction conference .

INSPECTION TRIP #2

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a post paint inspection .

INSPECTION TRIP #3

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a delivery inspection .

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.



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PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this document. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

A drawing of the apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

FINAL DRAWING

There will be a revised drawing of the truck with all the changes made during production provided at pickup.

DRAWING, PRELIMINARY LAYOUT, PUMP OPERATOR'S PANEL

A detailed drawing, to scale, of the pump operator's panel will be provided for the purpose of illustrating the standard location(s) of controls and discharges on the pump operator's panel. The drawing will not be meant as an approval, or final construction drawing, rather it will be used as an illustration drawing of a standard panel layout. This drawing will include all of the gauges and controls located on the pump operator's panel.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.



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VELOCITY CHASSIS

The Pierce Velocity® is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

TARGET OVERALL LENGTH

The target overall length of the apparatus will be approximately 31' .25" .

WHEELBASE

The wheelbase of the vehicle will be 175.50".

GVW RATING

The gross vehicle weight rating will be 42,000 pounds .

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 18,000 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.



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There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be 0 degrees for optimum tire life.

The ball joint bearing shall be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends must have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 18,000 lb.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have a torsion bar type spring. In addition, each front wheel end will have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will have at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension completed durability testing that simulated 140,000 miles of inner city driving.



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FRONT SHOCK ABSORBERS

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

FRONT OIL SEALS

Oil seals with viewing window will be provided on the front axle.

FRONT TIRES

Front tires will be Goodyear® 315/80R22.50 radials, 20 ply G289 WHA tread, rated for 20,400 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud, 11.25" bolt circle.

TURNING RADIUS REPORT

A turning radius analysis of the custom Pierce chassis that we are proposing will be included with this document. This analysis will provide information on the inside turning radius, the outside turning radius, the curb to curb turning radius, and the wall to wall turning radius.

REAR AXLE

The rear axle will be a Meritor™, Model RS-23-186, with a capacity of 24,000 lb.

TOP SPEED OF VEHICLE

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 68 mph.

SUSPENSION, REAR

Rear suspension will be Reyco model 79KB with a ground rating of 27,000 pounds. Spring hangers and mounting components will be cast. The suspension utilizes two attaching points with variable rate spring cams and rubber bushed adjustable torque arms.

REAR OIL SEALS

Oil seals will be provided on the rear axle(s).

REAR TIRES

Rear tires will be four (4) Goodyear® 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE BALANCE

All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.



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TIRE PRESSURE MANAGEMENT

There will be a RealWheels© LED AirSecure tire alert pressure management system provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of two (2) tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops five (5) to eight (8) psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.

FRONT HUB COVERS

Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

MUD FLAP EVEN WITH FENDERETTS

A mud flap shall be installed so it is even with the outside fenderetts.

MUD FLAPS

Mud flaps with a Pierce logo will be installed behind the front and rear wheels.

CROSSFIRE PRESSURE LABELS

The PSI label for the Crossfire tire pressure equalization system will state 85 PSI.

AIR PRESSURE TIRE EQUALIZATION

A Crossfire air pressure equalization system will be provided on the rear dual wheels. This system will equalize the tire air pressure in the rear duals and indicate over or under inflation.

STABILIZER SYSTEM (REAR VALVE STEMS)

A valve stem stabilizer system will be provided on the rear duals.

AUTOMATIC TIRE CHAINS

One (1) pair of Rud 18 strand automatic tire chains will be provided at the rear. The system will be electric-over-air operated with a switch on the cab instrument panel. The system may be engaged at speeds up to 25 mph and operated at speeds up to 35 mph.

WHEEL CHOCKS

There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.



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WHEEL CHOCK BRACKETS

There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted forward of the left side rear tire.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. An "off road traction" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.



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BRAKES

The service brake system will be full air type.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

BRAKE SYSTEM AIR COMPRESSOR

The air compressor will be a Cummins/WABCO with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Bendix® dual brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 4,362 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
- 1/4 turn drain valve on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

- Bendix AD-9 air dryer, with heater and coalescing filter

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.



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AIR INLET

One (1) air inlet with 3D series male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located rearward in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female fitting will also be provided with the loose equipment.

AIR OUTLET

One (1) air outlet will be installed with a female coupling and shut off valve, located in the front body compartment on driver side. This system will tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Female coupling and male fitting will be .25" thread.

A mating male fitting will be provided with the loose equipment.

AIR HOSE

There will be two (2) 25' length(s) of air hose furnished with fittings.

An air chuck will be provided with the air hose. The air chuck will fit the valve stems that are provided on the tires.

AIR TANK, ADDITIONAL

An additional air tank with 1,454 cubic inch displacement will be provided to increase the capacity of the air system. This tank will be dedicated for air horn use under the DS running board per 33960

The air tank will be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

The output flow of the engine air compressor varies with engine RPM. Full compressor output is only achieved at governed engine speed. Engine speed may be limited by generators, pumps and other PTO driven options.

AUXILIARY BRAKING SYSTEMS

When two (2) separate auxiliary braking systems are installed on a unit they will be programmed or wired to provide separate or simultaneous operation.

In this case, it will be the transmission retarder and the Jake Brake. They will be set up so when the retarder comes on, the Jake will activate at the same time.



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The Jake will start on deceleration and the transmission retarder will also start on brake application.

COMPRESSION FITTINGS ONLY

Any nylon tube on the brake system that is pneumatic will be plumbed with compression type fittings where applicable. Push lock fittings will not be acceptable for any pneumatic nylon tube plumbing.

COMPRESSOR AIR LINE

The air line from the air compressor to the remote mounted governor will be stainless steel braid in place of standard Aeroquip hose.

ENGINE

The chassis will be powered by an electronically controlled engine as described below:

Make:	Cummins
Model:	L9
Power:	370 hp at 2100 rpm
Torque:	1250 lb-ft at 1400 rpm
Governed Speed:	2100 rpm
Emissions Level:	EPA 2017
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	543 cubic inches (8.9L)
Starter:	Delco Remy 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

The engine will include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

HIGH IDLE

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.



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The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver will be able to turn the engine brake system on/off and have high, medium and low setting.

The high setting of the brake application will activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

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

CLUTCH FAN

A Horton® fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position. A compression fitting will be provided on the fan hub.

CHASSIS SERVICE

Chassis service will be done when the apparatus arrives at the dealer location, but before delivery to the customer.

Service will include:

- Engine Oil and filter change
- Fuel filter change
- Grease drivelines
- Check and fill all fluids.

FLUID ANALYSIS

Fluid sample analysis of the engine oil, the transmission fluid, and the cooling system will be provided. Written results of these tests will be provided to DFD Fleet Management.



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ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will be stainless steel from the turbo to the engine's aftertreatment device, and will be 4.00" in diameter. The exhaust system will include a single module aftertreatment device to meet current EPA standards. An insulation wrap will be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The exhaust pipe will be brought out from under the body at a 20 degree angle to the rear.

The diffuser will not be cut straight to the body, and the outer edge will extend slightly outside of the body. There will be a minimum of 2.50" from the exhaust pipe to the under side of the body heat shield. The last 7.00" of the exhaust will be free of hangers and/or clamps.

RADIATOR

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

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.



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There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will 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 will be isolated from the chassis frame rails with rubber isolators.

The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will 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.

A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates® silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer.

The chassis manufacturer will also use Gates brand hose on other heater, defroster and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances a comparable silicone hose from another manufacturer will be used.

Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

RADIATOR HOSE MODIFICATION

The rubber hose at the radiator will be extended 4.00".

VINYL WINTER FRONT

A custom one-piece white vinyl winter front will be provided for use in extreme cold weather. The vinyl will cover the front cab grille and will be held in place with quarter turn fasteners. There will be an 5.50" x 16.00" opening in the center for proper ventilation.

FUEL TANK

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.



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A 0.75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

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

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the driver's side of the body and be covered with a hinged, spring loaded, polished stainless steel door that is marked "Diesel Exhaust Fluid Only".

The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

FUEL SHUTOFF

A fuel line shutoff valve will be installed on both the inlet and outlet of the primary fuel filter.

TRANSMISSION

An Allison 5th generation, model EVS 3000PR, electronic torque converting automatic transmission with retarder will be provided.

Two (2) PTO openings will be located on both sides of converter housing (positions 4 o'clock and 8 o'clock) as viewed from the rear.

A transmission temperature gauge with red light and audible alarm will be installed on the cab instrument panel.

The transmission retarder control will be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.



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The transmission will have the 1000 ft. lb. torque (low) spring setting for retardation force.

The transmission retarder will have a master "on/off" switch on the instrument panel. Also, a red indicator light will be provided to warn that transmission is being overworked.

The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.

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

TRANSMISSION SHIFTER

A six (6)-speed push button shift module with the four (4) + two (2) "Mode" button will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The Allison shifter will be a double-digit display model.

The transmission ratio will be 1st - 3.49 to 1.00, 2nd - 1.86 to 1.00, 3rd - 1.41 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.65 to 1.00, R - 5.03 to 1.00.

TRANSMISSION COOLER

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission retarder oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

TRANSMISSION FLUID LABEL

A label located on the transmission fluid fill access door will be provided. The label will read "Trans Fluid TRANSynd Only".

DOWNSHIFT MODE (W/ENGINE BRAKE)

The transmission will be provided with an aggressive downshift mode.



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This will provide earlier transmission downshifts to 3rd gear from 6th gear, resulting in improved engine braking performance.

TRANSMISSION FLUID

The transmission will be provided with TES - 295 TranSynd heavy duty synthetic transmission fluid.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1710 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

STEERING

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: Denver

The second row of text will be: Fire

The third row of text will be: Department

AUTOMATIC CHASSIS LUBRICATION

A Vogel Automatic Lubrication System will be provided. The lubrication will be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations



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listed. The electronic control unit that forms part of the system will activate the pump after an adjustable interval time. The unit will control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.

The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, will be located in the right rear pump house area on the apparatus.

- TAK- 4 Control Arm Pivot Points
- Rear Axle Slack Adjusters
- Rear Axle Brake Cam Screws
- Rear Suspension Spring Pins
- Rear Suspension Shackle Pins

BUMPER

A one (1) piece, ten (1) gauge, 304-2B type polished stainless steel bumper, a minimum of 10.00" high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper will be extended 19.00" from front face of cab.

Documentation will be provided, upon request to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge, and suction connections.

GRAVEL PAN

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

CENTER HOSE TRAY

A hose tray, constructed of aluminum, will be placed in the center of the bumper extension.

The tray will have a capacity of 150' of 1.50" double jacket cotton-polyester hose.

Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.

HOSE TRAY COVER

A bright aluminum treadplate cover will be provided over the center hose tray.



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The cover will be "notched" allowing the hose to be pre connected to hose connection.

The cover will be attached with a stainless steel hinge.

Two (2) flush lift and turn latch will secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes will be painted the same color as the frame.

TOW HOOKS

Two (2) chromed steel tow hooks will be installed under the bumper and attached to the front frame members. The tow hooks will be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks will not be used for lifting of the apparatus.

CAB

The Velocity cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing.

To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick



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supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be a full-tilt style. A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 62.95" in the center position and 68.75" in the outboard positions.

The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

Full-circular, aluminum, inner fender liners in the wheel wells will be provided.



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PANORAMIC WINDSHIELD

A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of 0.50" aluminum plate that is welded to both the 0.25" firewall and 0.38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The back of the engine tunnel will be no higher than 16.25" off the crew cab floor.

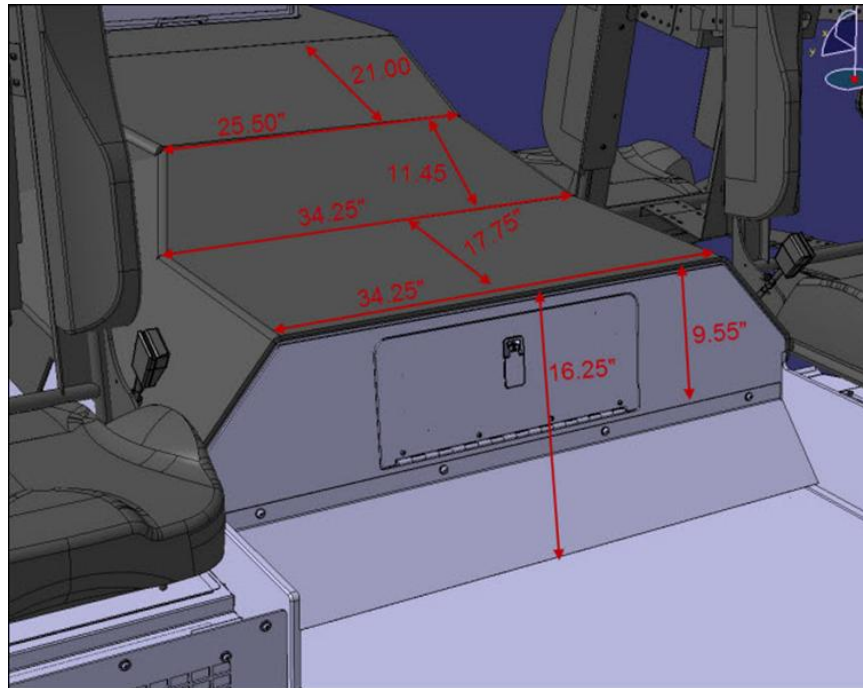
The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an



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aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.



CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

CAB LIFT

A hydraulic cab lift system will 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 hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.



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The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.

FRONT CAB TRIM

A band of 22 gauge brushed stainless steel trim will be installed across the front of the cab, from door hinge to door hinge. The trim band will be centered on the head lights and applied with two (2)-sided tape. A 0.625" self adhesive trim strip will be applied around the perimeter of the trim band.

There will be no covers provided over the painted cab corner where the cab turn signals are located.

SIDE OF CAB MOLDING

Chrome molding will be provided on both sides of cab.

MIRRORS

For enhanced visibility, safety and overall aesthetics, a forward positioned One-Eleven custom mirror will be mounted on each side of the front cab roof corner. Both front cab roof corners will be reinforced with an aluminum casting at the mounting location providing maximum stability for the mirror arm and head assembly. The mirror arm substructure will extend forward and outward of the cab and will be constructed out of 4.00" diameter, 0.25" wall, aluminum



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tubing. For reduced service cost, the mirror will include a dual breakaway design, controlled by a rotational detent mechanism. In the event of an impact, the mirror arm will breakaway to either the inboard or the outboard position. The One-Eleven mirror head, and injection molded arm cover, will offer a sleek aerodynamic styling with overall width of 115.80" (reduces vehicle width by 7.00" when compared to door mount bus style mirrors). The arm cover finish will be chrome. The mirror head finish will be chrome. The mirror head and arm will provide a seamless appearance, and include a black painted metal cover plate on the underside of the arm to reduce glare. For maximum visibility and safety, a flat mirror section will be provided that measures 83 square inches in reflective area. There will also be an integral convex mirror section that will measure 27 square inches in reflective area. The flat glass and convex section in each mirror will be heated and adjustable with remote controls that are convenient to the driver.

CAB DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 76.46" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab doors will measure a minimum of 37.87" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.

The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 1041. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.



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A chrome grab handle will be provided on the inside of each cab and crew cab door.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

Door Panels

The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high x 4.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door.

The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps.

CAB EXTERIOR HANDRAILS

A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.



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STIRRUP STEPS

A stirrup step will be provided below each cab and crew cab door. The steps will be designed with a grip pattern punched into bright aluminum treadplate material providing support, slip resistance, and drainage. The steps will be a bolt-on design and provide a 18.50" wide x 5.00" deep stepping surface. Each step will provide a step height of 8.25" from the top of the stirrup step to the first step of the cab.

The stirrup step will be lit by a white 12 volt DC LED light provided on the step.

The step light will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body step lights.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

The lights will be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high.

WINDOWS INTERIOR TRIM

For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.

FRONT WINDOWS FOR RAISED ROOF

To enhance both visibility out of and light penetration into the crew cab, two (2) bonded windows will be provided in the front slanted portion of the raised roof. Each window will be approximately 15.00" wide x 7.00" high. The profile of the glass will match the painted metal side sheet opening, creating a uniform threshold appearance. The windows will be bonded to the vehicle using urethane adhesive.



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WINDOWS, REAR

The rear wall of the crew cab will have two (2) windows, each being 11.25" wide x 18.00" high.

WINDOW INTERIOR TRIM

For improved aesthetics, the cab rear wall windows will include a vacuum formed ABS interior trim panel.

ENCLOSURE WIRES

Stainless steel cover will be installed over the power point wires, under the cab, inside the engine tunnel, passenger side rear for protection.

CAB INTERIOR

With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

The center console will be a high impact ABS polymer and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield.

The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways



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located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be 36 oz dark silver gray vinyl. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

CAB INTERIOR PAINT

The following metal surfaces will be painted black, vinyl textured paint:

- Modesty panel in front of driver
- Vertical surface of dash in front of the officer (not applicable for recessed dash)
- Glove box in front of the officer (if applicable)
- Power distribution in front of the officer
- Rear heater vent panels

The remaining cab interior metal surfaces will be painted gray, vinyl texture paint.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

CAB DEFROSTER

To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable metal cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.



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CAB/CREW CAB HEATER

Two (2) 36,702 BTU auxiliary heaters with 276 SCFM (each unit) of air flow will be provided inside the crew cab, one (1) in each outboard rear facing seat riser. The heaters will include high performance dual scroll blowers, one (1) for each unit. Outlets for the heaters will be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions.

The heater/defroster and crew cab heaters will be controlled by an integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear independently. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature.

AIR CONDITIONING

Due to the large space inside the cab, a high-performance, customized air conditioning system will be furnished. A 19.10 cubic inch compressor will be installed on the engine.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof. The fans will be mounted on top of the condenser. The condenser cover and mounting legs to be painted to match the cab roof.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

There will be a hinge on the forward edge of the filter cover and two (2) knob fasteners on the rear edge to allow easy access.

The evaporator unit will have a 49,000 BTU (4.08 tons) rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the evaporator cover per the following:

- Four (4) will be directed towards the drivers location
- Four (4) will be directed towards the officers location



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- Eight (8) will be directed towards crew cab area

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

The air conditioner will be controlled by dual zone integral electronic control panels for the heater, defroster and air conditioner. The cab control panel will be located in the center console. For ease of operation, the control panels will include variable adjustment for temperature and fan control.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a 0.20" high density polyethylene corrugated material. Each headliner will be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control.

Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide and R-value of 4 per 1.00" thickness.

SUN VISORS

Two (2) smoked Lexan™ sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver side and passenger side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.



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The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

CAB SAFETY SYSTEM

The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will 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.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the



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safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag
- Passenger side knee bolster air bag
- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SIDE ROLL PROTECTION

The SRS system will provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system will deploy the following components in the event of a side roll:

- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SEATING CAPACITY

The seating capacity in the cab will be six (6).

DRIVER SEAT

A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following features incorporated into the side roll protection system:



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- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER SEAT

A Pierce PS6® seat will be provided in the cab for the passenger. The seat will be a cam action type with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not belted.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A compartment for the radio amplifier will be located on the floor of the cab behind the front passenger seat. A lift-up door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior.



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REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle. It will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt and firmly hold the occupant in the event of a side roll.



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The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING CENTER SEATS

There will be two (2) forward facing, Pierce PS6® seats provided at the center position in the crew cab. For optimal comfort, the seats will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat backs will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats will include the following feature incorporated into the side roll protection system:

- A seat safety system will be included. When activated, this system will pretension the seat belts around the occupants to firmly hold them in place in the event of a side roll.

The seats will be furnished with 3-point, shoulder type seat belts. The seat belts will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

SEAT UPHOLSTERY

All Pierce PS6 seat upholstery will be gray woven with black Imperial 1200 material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of five (5) SCBA brackets.

SEAT BELTS

All seating positions in the cab, crew cab and tiller cab (if applicable) will have red seat belts.



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To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

A total of six (6) seating positions will have the adjustable shoulder harness.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 14.1.7.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) Weldon 808* series, dual LED dome lights with grey bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white .

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

OVERHEAD MAP LIGHTS

There will be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light will include a switch on the light housing.

The light switches will be connected directly to the battery switched power.



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CAB SPOTLIGHT

There will be two (2) Golight® Stryker™, Model 30**4, white LED spotlights located on the cab roof, one each side. The spotlights will be mounted on painted pedestals.

These lights may be load managed when the parking brake is applied.

SPOTLIGHT CONTROLLER

There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlights will be located one (1) within reach of the driver overhead and one (1) within reach of the officer overhead.

HAND HELD LIGHT

There will be two (2) 12v Streamlight, Fire Vulcan, Model #44451, lights mounted shipped loose.

Each light housing will be orange in color and be provided with a C4 LED and two (2) "ultra bright blue tail light LEDs" The tail light LEDs will have a dual mode of blinking or steady.

Vehicle mount with 12VDC direct wire charging rack.

Quick release buckle strap will be included.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

GAUGES

The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (Volts)

- Low volts (11.8 VDC)

- Amber indicator on gauge assembly with alarm



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High volts (15 VDC)

Amber indicator on gauge assembly with alarm

Very low volts (11.3 VDC)

Amber indicator on gauge assembly with alarm

Very high volts (16 VDC)

Amber indicator on gauge assembly with alarm

- Tachometer (RPM)

- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

- Fuel level gauge (Empty - Full in fractions)

Low fuel (1/8 full)

Amber indicator on gauge assembly with alarm

Very low fuel (1/32) fuel

Amber indicator on gauge assembly with alarm

- Engine oil pressure gauge (PSI)

Low oil pressure to activate engine warning lights and alarms

Red indicator on gauge assembly with alarm

- Front air pressure gauge (PSI)

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

- Rear air pressure gauge (PSI)

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

- Transmission oil temperature gauge (Fahrenheit)

High transmission oil temperature activates warning lights and alarm



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Amber indicator on gauge assembly with alarm

- Engine coolant temperature gauge (Fahrenheit)

High engine temperature activates an engine warning light and alarm

Red indicator on gauge assembly with alarm

- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)

Low fluid (1/8 full)

Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)



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- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still



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exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.



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Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

CUSTOM SWITCH PANELS

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower



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cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.



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AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm shall be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will not activate any alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.



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SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliques. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 20 amps at 12 volts DC
- Power and ground will terminate center lower console behind panel #9 rearward
- Termination will be with 3/8" studs and plastic covers
- Wires will be sized to 125% of the protection

This circuit(s) may be load managed when the parking brake is set.



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SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

The positive wire will be connected directly to the battery power.

The negative wire will be connected to ground.

Wires will be protected to 15 amps at 12 volts DC.

Power and ground will terminate on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical with an enclosure on the inside of engine tunnel for protection - see photo..

Termination will be with 15 amp, power point plug with rubber cover.

Wires will be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be four (4) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate two in the front of the cab behind panel #9 two in the rear, tucked into the forward facing seat riser
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125 percent of the protection

The circuit(s) may be load managed when the parking brake is set.

RECESS, DASH PANEL

The dash panel across from the officer will be recessed to accommodate the mounting of miscellaneous items. The recess will be 8.25" down x 7.81" back and 20.88" wide.



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INFORMATION CENTER

An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

HOME/TRANSIT SCREEN

This screen will display the following:



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- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)
- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

ON SCENE SCREEN

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

VIRTUAL BUTTONS

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

PAGE SCREEN

The page screen will display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
 - Faults
 - Listed by order of occurrence
 - Allows to sort by system
 - Interlock



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- Throttle Interlocks
 - Pump Interlocks (if equipped)
 - Aerial Interlocks (if equipped)
 - PTO Interlocks (if equipped)
- Load Manager
 - A list of items to be load managed will be provided. The list will provide a description of the load.
 - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
 - The screen will indicate if a load has been shed (disabled) or not shed.
 - "At a glance" color features are utilized on this screen.
- Systems
 - Command Zone
 - Module type and ID number
 - Module Version
 - Input or output number
 - Circuit number connected to that input or output
 - Status of the input or output
 - Power and Constant Current module diagnostic information
 - Foam (if equipped)
 - Pressure Controller (if equipped)
 - Generator Frequency (if equipped)
- Live Data
 - General Truck Data
- Maintenance
 - Engine oil and filter
 - Transmission oil and filter
 - Pump oil (if equipped)
 - Foam (if equipped)
 - Aerial (if equipped)
- Setup
 - Clock Setup
 - Date & Time
 - 12 or 24 hour format
 - Set time and date
 - Backlight
 - Daytime
 - Night time



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- Sensitivity
- Unit Selection
- Home Screen
- Virtual Button Setup
- On Scene Screen Setup
- Configure Video Mode
 - Set Video Contrast
 - Set Video Color
 - Set Video Tint
- Do Not Move
 - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicate
 - Driver Side Cab Door
 - Passenger's Side Cab Door
 - Driver Side Crew Cab Door
 - Passenger's Side Crew Cab Door
 - Driver Side Body Doors
 - Passenger's Side Body Doors
 - Rear Body Door(s)
 - Ladder Rack (if applicable)
 - Deck Gun (if applicable)
 - Light Tower (if applicable)
 - Hatch Door (if applicable)
 - Stabilizers (if applicable)
 - Steps (if applicable)
- Notifications
 - View Active Alarms
 - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
 - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.



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VEHICLE DATA RECORDER

There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

The seat belt monitoring screen will become active on the Command Zone color display when:

- The home screen is active:
 - and there is any occupant seated but not buckled or any belt buckled with an occupant.



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- and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

INTERCOM SYSTEM (shipped loose)

- Four (4) Remote Headset Station Model U3802
- One (1) Master Station Model U3800
- Four (4) Remote Interface Module PTT Model U3811
- Five (5) Headset Behind-The -Head Model H3342
- 25 Feet of 6 Conductor Wire
- 25 Feet of 4 Conductor Wire
- One (1) Power Cord (For U3800) Model C3820
- Five (5) Remote Jumper Cord 12Ft Model C38-12
- Two (2) Remote Jumper Cord 25Ft Model C38-25
- Six (6) Connector Kit 6 pin
- Two (2) Connector Kit 4 pin
- Two (2) Radio Interface Cords C3821

RADIO ANTENNA MOUNT

There will be one (1) standard 1.125", 18 thread, NMO type antenna mounting base(s) installed just to the rear of officer seat on the cab roof with high efficiency, low loss, coaxial cable(s) routed within the cab / crew area to front passenger side corner of the raised roof . A weatherproof cap will be installed on the mount.

VEHICLE CAMERA SYSTEM

There will be a color vehicle camera system provided with the following:

- One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse

The camera images will be displayed on the driver's vehicle information center display. Audio from the microphone on the active camera will be not provided.

The following components will be included:

- One (1) SV-CW134639CAI, camera
- One (1) amplified speaker (if applicable)
- All necessary cables



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ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

SOLID-STATE CONTROL SYSTEM

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components



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- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

The on-board information center will include the following diagnostic information:

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active.



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Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

TECH MODULE WITH WIFI

An in cab module will provide WiFi wireless interface and data logging capability. The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

The data logging capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

PROGNOSTICS

A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events.

The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics will include:

- Engine oil and filter
- Transmission oil and filter
- Pump oil (if equipped)
- Foam oil (if equipped)
- Aerial oil and filter (if equipped)

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.



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The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

VOLTAGE MONITOR SYSTEM

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

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

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

- The studs will consist of the following:
- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

ENHANCED SOFTWARE

The solid-state control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio



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frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).



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5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.
6. All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

There will be four (4) 12 volt Exide®, Model 31S950X3W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 3800 CCA at 0 degrees Fahrenheit
- 760 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.



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An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

BATTERY CHARGER

There will be a Kussmaul™ 1200, Model 091-187-12-Remote, battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to the battery charger.

The battery charger will be located in the left body compartment mounted on the back wall as high as possible.

The battery charger indicator will be located near the driver's seat riser with special bracketry.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul Model 091-55-15-120, 15 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus without the use of the generator.

The shoreline inlet(s) will include yellow weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline(s) will be connected to the battery charger and the 6 place outlet in the crew cab .

There will be a mating connector body supplied with the loose equipment.



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There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side rear bulkhead of body.

COVER IO MODULE

A cover will be fabricated and installed to the rear face of the driver side battery box to cover the electrical IO modules for protection. The cover will protect the modules from the outside elements as much as possible without having to be water tight.

ALTERNATOR

A Leece-Neville, Model BLP4004H, alternator will be provided. It will have a rated output current of 350 amp as measured by SAE method J56. The alternator will feature an integral, self diagnostic regulator and rectifier. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

WIRE COVER

There will be a stainless steel wire cover provided for the electrical connections inside the driver side, forward location in the pump house.

WEATHER PACK CONNECTORS SEALED

All unused open Weather Pack connectors will be plugged with mating tower and shroud connectors and cavity plugs.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

The exception to this will be the fuel sender terminal. The fuel sender terminal will be sealed.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.



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For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
 - If enabled:
 - "Load Man Hi-Idle On" will display on the information center.
 - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
 - ON = not shed
 - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will 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.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by



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one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

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

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome trim housing on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS

There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

ADDITIONAL DIRECTIONAL LIGHTS

There will be two (2) Whelen, Model M6T*, amber LED arrow directional lights provided on the exterior back of the cab, one (1) on each side. The lens color(s) to be the same as the LEDs.

These lights will be mounted low on the back wall of the crew cab in 15 degree recessed angle brackets.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.



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- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

INTERMEDIATE LIGHT

There will be two (2) Truck-Lite®, part number 303757Y, 2.24" diameter lights with amber LEDs, grommet mount and chrome cover furnished, one (1) each side in the rear fender panel. The light will double as a turn signal and marker light.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Truck-Lite®, Model 35200R, LED lights used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height



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There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

- Two (2) Whelen®, Model M6BTT, red LED stop/tail lights
- Two (2) Whelen, Model M6T, amber LED arrow turn lights

The lights shall be provided with color lenses.

Each light will be installed separately at the rear with Whelen, Model M6FC, chrome flanges.

There will be two (2) Whelen Model M6BUW, LED backup lights with chrome trim provided.

LICENSE PLATE BRACKET

There will be one (1) Weldon, Model 0J10-0393-00, license plate bracket located below the tailboard on a removable bolt-on bracket located driver side.

A Weldon, Model 9186-23882-30, incandescent step light will illuminate the license plate.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

BACK-UP OBSTACLE SENSING SYSTEM

A SenseStat ultrasonic backing sensor system with 4 individual zones and an LED distance display will be provided.

The system will detect objects that are up to eight (8) feet from the rear of the vehicle reading each of four (4) separate sensors, and displaying the distance to the one that is closest to an object.



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A 3.5"W x 2.9"L x 1.6"H, four (4) column color LED display located next to driver will show the direction and location of the obstacle. The display will show the distance from the sensor to the obstacle in meters or in feet & fractions of a foot to the sensor that is closest to an object. There will be an audible alarm with volume control integrated into the display.

PERIMETER SCENE LIGHTS, CAB

There will be a Truck-lite, Model 44310C, 4.00", 12 volt DC white LED light, with Model 40700 grommet mount and Model 95948 pigtail provided for each cab door. Lighting will be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which will be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

PUMP HOUSE PERIMETER LIGHTS

There will be two (2) Truck-Lite, Model 44310C, 4.00" white LED 12 volt DC weatherproof lights with Model 40700, grommets provided under the pump panel running boards, one (1) each side.

The lights will be controlled by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS

There will be two (2) Truck-Lite, Model 44310C, 4.00" 12 volt DC LED lights with Model 40700, grommet provided under the rear step area on the body, one (1) each side shining to the rear.

The perimeter scene lights will be activated by a switch within reach of the driver is activated.

STEP LIGHTS

Four (4) white LED step lights will be provided. One (1) step light will be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

These step lights will be actuated with the pump panel light switch.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

CUP SWITCH

There will be a stainless steel cup switch at the rear of the truck for rear body bulkhead passenger side same as job #30237 lights.



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DECK LIGHTS

There will be two (2) Whelen®, Model MPPBCS, black with chrome housing 12 volt DC LED floodlights with on/off switch. Each light will be provided with a low profile pedestal/swivel mount provided at the rear of the hose bed, one (1) each side.

The lights will be activated by the switch included on the light(s).

REAR SCENE LIGHT(S)

There will be two (2) Whelen®, Model M6ZC, LED scene light(s) with chrome flange(s) installed at the rear of the apparatus, two (2) low height on the rear body bulkhead.

The light(s) will be controlled by a switch at the driver's side switch panel.

The light(s) may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will be one (1) Whelen® Pioneer™, Model PSL2*, 12 volt DC LED floodlight(s) provided on the front of the cab, centered. The light will be mounted directly to the cab and not on a bracket.

The painted parts of this light assembly to be white.

The lights will be steady burning with the selected switch features.

The light will be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- no additional switch location
- no additional switch location

These light(s) may be load managed when the parking brake is applied.

12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model P*H2*, 17,750 lumens 12 volt DC powered lights with white LEDs and a combination of flood and spot optics installed on the apparatus located, back of cab driver side.

The light(s) to be installed on push up side mount outside pole length to be 20.00" long with a handle holder and sensor connecting the pole to the Do Not Move Truck Indicator circuit.

The painted parts of this light assembly to be white.

The lights will be activated by a switch at the driver's side pump panel.



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The light(s) may be load managed when the parking brake is applied.

12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model P*H2*, 17,750 lumens 12 volt DC powered lights with white LEDs and a combination of flood and spot optics installed on the apparatus located, back of cab passenger side.

The light(s) to be installed on push up side mount outside pole length to be 20.00" long with a handle holder and sensor connecting the pole to the Do Not Move Truck Indicator circuit.

The painted parts of this light assembly to be white.

The lights will be activated by a switch at the driver's side pump panel.

The light(s) may be load managed when the parking brake is applied.

WALKING SURFACE LIGHTS

There will be One (1) Amdor®, Model AY-LB-12HW0**, white 12 volt DC LED strip light(s) provided in the cargo area(s) to illuminate the interior surface of the cargo area(s). Light(s) will be under the rear flange.

The light will be activated when the body step lights are on.

WATER TANK

Booster tank will have a capacity of 500 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated.

Tank joints and seams will be nitrogen welded inside and out.

Tank will be baffled in accordance with NFPA bulletin 1901 requirements.

Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions will interlock and will be welded to the tank bottom and sides.

Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.



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Tank top will be sufficiently supported to keep it rigid during fast filling conditions.

Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump that will be sized dependent on the tank to pump plumbing will be provided at the bottom of the water tank.

Sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated cradle assembly constructed of structural steel.

Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of steel bar channel or rectangular tubing.

Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

Stops or other provision will be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system will be approved by the tank manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

HOSE BED

The hose bed will be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.

Upper and rear edges of side panels will have a double break for rigidity.

The upper inside area of the beavertails will be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.



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Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats will be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation.

Hose bed will accommodate 300' X 1.75", 500' X 2.5", 500' X 2.5", 500' X 2.5", 300' X 1.75" .

HOSE BED DIVIDER

Four (4) adjustable hosebed dividers will be furnished for separating hose.

Each divider will be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.

Divider will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.

Divider will be held in place by tightening bolts, at each end.

Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

HOSEBED HOSE RESTRAINT

A 22 oz yellow hosebed cover will be furnished with permanent attachment at the front and STAYPUT™ shock cord loop fasteners on the sides. There will be STAYPUT™ shock cord loop fasteners at the bottom of the rear body sheet below the hosebed. The STAYPUT™ shock cord loop fasteners will be spaced at 12.00" intervals as practical along the sides and rear of the cover. The flap at the rear will be not weighted.

FILL DOME ACCESS

There will be two (2) fill dome(s) accessed through the vinyl hose bed cover. A flap(s) with Velcro® strips will be provided in the vinyl hose bed cover for access to the fill dome(s) without removing the front portion of the cover. The flap will be permanently attached along the forward edge.

RUNNING BOARDS

Running boards will be fabricated of .125" bright aluminum treadplate.

Each running board will be supported by a welded 2.00" square tubing and channel assembly, which will be bolted to the pump compartment substructure.

Running boards will be 12.75" deep and spaced .50" away from the pump panel.

A splash guard will be provided above the running board treadplate.



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TAILBOARD

The tailboard will also be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The tailboard area will be 16.00" deep.

The exterior side will be flanged down and in for increased rigidity of tailboard structure.

REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL

The rear facing surfaces of the center rear wall will be smooth aluminum.

The bulkheads, the surface to the rear of the side body compartments, will be smooth and the same material as the body.

Any inboard facing surfaces below the height of the hosebed will be aluminum diamondplate .

TOW BAR

A tow bar will be installed under the tailboard at center of truck.

Tow bar will be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly will be constructed of .38" structural angle. When force is applied to the bar, it will be transmitted to the frame rail.

Tow bar assembly will be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb, or a 20,000 lb straight horizontal pull in line with the centerline of the vehicle.

Tow bar design will have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

REAR BUMPER

A bright aluminum treadplate bumper will be provided at the rear of the truck. The bumper will be approximately 4.00" high, full width, it will be located at the rear of the truck. The bumper will be approximately 9.25" deep and mounted just below the body. The rear edge of the bumper will be raised.

Morton Cass will be inserted in the running boards.

Morton Cass will be inserted in the tailboard.

COMPARTMENTATION

Body and compartments will be fabricated of .125", 5052-H32 aluminum.

Side compartments will be an integral assembly with the rear fenders.



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Circular fender liners will be provided for prevention of rust pockets and ease of maintenance.

Side compartment flooring will be of the sweep out design with the floor higher than the compartment door lip.

The side compartment door opening will be framed by flanging the edges in 1.75" and bending out again .75" to form an angle.

Drip protection will be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel.

The top of the compartment will be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers will have the corners welded.

Side compartment covers will be separate from the compartment tops.

Front facing compartment walls will be covered with bright aluminum treadplate.

All screws and bolts which protrude into a compartment will have acorn nuts on the ends to prevent injury.

UNDERBODY SUPPORT SYSTEM

Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.

The support system will include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

Attached to the bottom of the steel vertical angles will be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.

A steel frame will be mounted on the top of these supports to create a floating substructure which will result in a 500 lb equipment support rating per lower compartment.

The floating substructure will be separated from the horizontal members with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body.

Isolators will have a broad load range, proven viability in vehicular applications, be of a fail safe design and allow for all necessary movement in three (3) transitional and rotational modes.



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The neoprene isolators will be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.

AGGRESSIVE WALKING SURFACE

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

LOUVERS

Louvers will be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they will be formed into the metal and not added to the compartment as a separate plate.

TESTING OF BODY DESIGN

Body structural analysis has been fully tested. Proven engineering and test techniques such as finite element analysis, stress coating and strain gauging have been performed with special attention given to fatigue, life and structural integrity of the cab, body and substructure.

Body will be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure will include:

- Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.
- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.
- Driving the vehicle at 35 mph on a washboard road.
- Driving the vehicle at 55 mph on a smooth road.
- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

Evidence of actual testing techniques will be made available upon request.

LEFT SIDE COMPARTMENTATION

The left side compartmentation will consist of three rollup door compartments.

A full height, rollup door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 22.50" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 16.75" wide x 56.88" high.

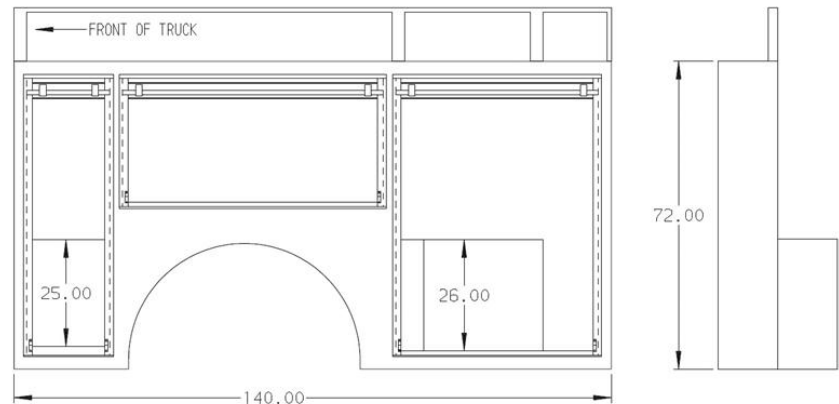


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A rollup door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening will be a minimum of 58.25" wide x 23.13" high.

A full height, rollup door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.75" wide x 67.63" high x 12.00" deep. A section of this compartment will be 25.88" deep for the first 31.50" width x 26.00" height directly behind the rear wheels. The clear door opening will be a minimum of 44.75" wide x 57.88" high.



COMPARTMENT	CLEAR DOOR OPENINGS					
	AMDOR		GORTITE		ROM	
	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
Ahead of axle	17.50	56.88	16.75	58.00	16.94	58.25
Over axle	59.00	23.13	58.25	24.25	58.44	24.50
Behind axle	45.50	57.88	44.75	59.00	44.94	59.25

The interior height of the compartments shall be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments shall be measured from the back wall to the inside of the door frame.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

RIGHT SIDE COMPARTMENTATION

The right side compartmentation will consist of two rollup door compartments.

A rollup door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 22.50" wide x 32.62" high x 25.88" deep in the lower 25.00" of the

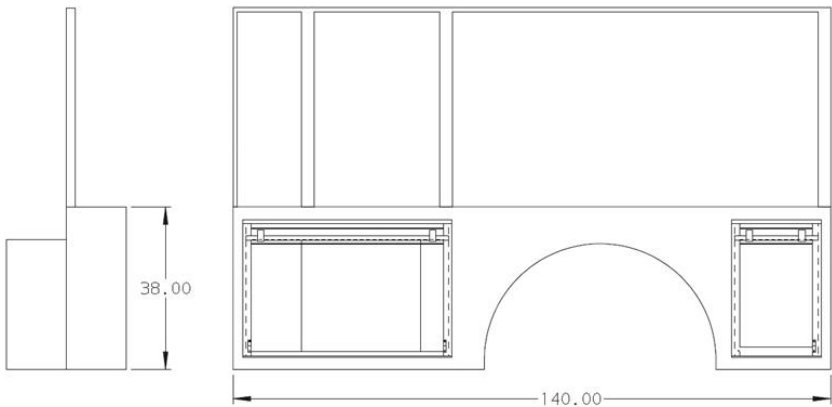


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compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 16.75" wide x 22.88" high.

A rollup door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.75" wide x 33.63" high x 12.00" deep. A section of this compartment will be 25.88" deep for the first 31.50" width x 26.00" height directly behind the rear wheels. The clear door opening will be a minimum of 44.75" wide x 23.88" high.



COMPARTMENT	CLEAR DOOR OPENINGS					
	AMDOR		GORTITE		ROM	
	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
Ahead of axle	17.50	22.88	16.75	24.00	16.94	24.25
Behind axle	45.50	23.88	44.75	25.00	44.94	25.25

The interior height of the compartments will be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments will be measured from the back wall to the inside of the door frame.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

SIDE COMPARTMENT ROLLUP DOOR(S)

There will be five (5) compartment doors installed on the side compartments, double faced, aluminum construction, satin aluminum and manufactured by AMDOR™ brand rollup doors.

Door(s) will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a



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clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.

The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of rollup door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A polished stainless steel lift bar to be provided for each roll-up door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded rollup door wear components will be constructed of Type 6 nylon.

Each rollup door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

The header for the rollup door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

REAR COMPARTMENTATION

A roll-up door compartment above the rear tailboard will be provided.

The interior dimensions of this compartment will be 40.00" wide x 40.63" high x 25.88" deep. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartment will be calculated with the compartment door closed.

A louvered, removable access panel will be furnished on the back wall of the compartment.

The rear compartment will be open into the rear side compartments.

The clear door opening of this compartment will be a minimum of 33.25" wide x 30.88" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.



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ROLLUP REAR COMPARTMENT DOOR

The rear compartment will have a rollup door.

The door will be double faced, aluminum construction, satin aluminum and manufactured by AMDOR™ brand rollup doors.

The door will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.

The door will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of rollup door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A polished stainless steel lift bar to be provided for each roll-up door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded rollup door wear components will be constructed of Type 6 Nylon.

The door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

The header for the rollup door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

SCUFFPLATE

A brushed stainless steel scuffplate shall installed on the sides of the hosebed area both sides and front. This scuffplate shall cover from the top flange of the hosebed area down to the hosebed grating. The scuffplate shall be fastened with self tapping screws.



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COMPARTMENT LIGHTING

There will be six (6) compartments with On Scene Solutions LED compartment light strips. The compartments with these strip lights will be located each compartment . Two (2) strip lights will be installed vertically, one (1) each side of the compartment door opening. The lights will be sized to accommodate the compartment door opening.

The remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door, will automatically turn the compartment lighting on.

COVER, CARGO COMPARTMENT

A 22 oz yellow vinyl cover will be provided over each cargo compartment. The cover will be secured with an awning rail at the front and Velcro® fasteners on the sides and rear. A quantity of one (1) cover(s) will be required.

MOUNTING TRACKS

There will be two (2) sets of tracks for mounting shelf(s) in upper portion of LS1 and RS1. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be three (3) shelves with a capacity of 500 lb provided.

The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The location(s) will be in RS1 in the lower third, in LS1 in the upper third and in LS1 in the upper third.

OVAL STRAPPING HERON RIB

one (1) roll (s) shall be provided and shipped loose with the truck for the department to install. The color will be red.

ACCESS PANEL

A removable access panel will be provided in the left front compartment . This panel will be size to fit and will be held in place with 1/4 turn fasteners. It will provide access to intake relief valve .



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PARTITION, TRANSVERSE REAR COMPARTMENT

Two (2) partitions will be bolted in place to separate left and right side rear compartments from the rear tailboard compartment.

RUB RAIL

Bottom edge of the side compartments and rear rails will be trimmed with a bright aluminum extruded rub rail.

Trim will be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

The rub rails will be spaced out far enough to protect the lift bars on the rollup doors.

BODY FENDER CROWNS

Polished stainless steel fender crowns will be provided around the rear wheel openings with a dielectric barrier will be provided between the fender crown and the fender sheet metal to prevent corrosion.

The fender crowns will be held in place with stainless steel screws that thread directly into a composite nut and not directly into the parent body sheet metal to eliminate dissimilar metals contact and greatly reduce the chance for corrosion. Rubber welting will be provided between the body and crown.

BODY FENDER LINER

A painted fender liner will be provided. The liners will be removable to aid in the maintenance of rear suspension components.

HARD SUCTION HOSE

Hard suction hose will not be required.

HANDRAILS

The handrails will be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

Handrails will be provided to meet NFPA 1901 section 15.8 requirements. The handrails will be installed as noted on the sales drawing.



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- One (1) full length, vertical handrail will be mounted on the left side rear beavertail.
- One (1) standard length offset handrail will be mounted on the right side rear beavertail.

- One (1) horizontal handrail will be provided above the hose bed at the rear of the apparatus. The hose bed dividers do not require additional reinforcement.
- One (1) full width horizontal handrail will be provided below the hose bed at the rear of the apparatus.

AIR BOTTLE STORAGE (SINGLE)

A quantity of four (4) air bottle compartments, approximately 7.50" wide x 7.50" tall x 26.00" deep, will be provided on the left side forward of the rear wheels, on the left side rearward of the rear wheels, on the right side forward of the rear wheels and on the right side rearward of the rear wheels. The compartment will be square with angled corners. A polished stainless steel door with a chrome plated flush lift & turn latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

MOUNTING TRACKS

There will be one (1) pair of horizontal mounting tracks provided for mounting air bottle brackets in LS2. Each pair of mounting tracks will be provided with three (3) pair of mounting studs.

EXTENSION LADDER

There will be a 24', two (2) section, aluminum, Duo-Safety, Series 900-A extension ladder provided.

ROOF LADDER

There will be a 14' aluminum, Duo-Safety, Series 775-A roof ladder provided.

LADDER BRACKETS

The ladders will be installed on the right side of the hose body in lined brackets and held in place by chrome plated, quarter-turn spring loaded clamps. The clamps will be such that when the roof ladder is removed, the clamps can be moved a half turn to hold the extension ladder in place. The ladder brackets will be adjustable up and down.

FOLDING LADDER PROVIDED BY DEALER

NFPA 1901, 2016 edition, section 5.8.1.2 requires a folding ladder.



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The folding ladder is not on the apparatus as manufactured. There will be one (1) 10' aluminum FL-10 Alco-Lite folding ladder provided by the dealer. The ladder will be installed in a stainless steel trough mounted above the ladders on the ladder brackets.

BACKBOARD STORAGE TROUGH

A trough will be provided for storage of two (2) backboards. The trough will be constructed of stainless steel with a stop at the front of the truck. The trough will be located behind the ladders on the right side of the truck. The interior size of the trough will be 3.00" wide X 17.00" high X 12' 2" long. The sides will extend down and up, on the outer portion, 3.00" to allow the movement of the front backboard to the rear. A Velcro® strap will be provided at the rear to retain the backboards in the trough.

10' PIKE POLE

One (1) pike pole 10' long DUO Safety with a fiberglass handle will be provided and located on driver side compartment top.

PIKE POLE, 6'

One (1) pike pole, 6' long Duo Safety with a fiberglass handle, will be provided and located on the passenger's side catwalk.

PIKE POLE STORAGE

Chrome plated tulip clips will be used for pike pole storage and will be over the left and right compartments - no rubber coating on clips, inboard as far as possible. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

STEPS

An Eberhard bright finished folding type step will be provided on the front of each fender compartment.

REAR STEPS

Bright aluminum treadplate corner steps will be provided at the rear. All steps will provide adequate surface for stepping.

Two (2) additional folding steps, Eberhard, will be located driver side front bulkhead.

PUMP

Pump will be a Waterous CSU, 1500 gpm single (1) stage midship mounted centrifugal type.

Pump will be the class "A" type.

Pump will deliver the percentage of rated discharge at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.



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-70% of rated capacity at 200 psi net pump pressure.

-50% of rated capacity at 250 psi net pump pressure.

Pump body will be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

Pump will be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

Pump case halves will be bolted together on a single horizontal face to minimize chance of leakage and facilitate ease of reassembly. No end flanges will be used.

Discharge manifold of the pump will be cast as an integral part of the pump body assembly and will provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.

The three (3) 3.50" openings will be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

Impeller shaft will be stainless steel, accurately ground to size. It will be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller will have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.

Bearings will be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings will be used.

Pump will be equipped with a self-adjusting, maintenance-free, mechanical shaft seal.

The mechanical seal will consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring will press against a highly polished stainless steel stationary ring that is sealed within the pump body.

In addition, a throttling ring will be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance will not deteriorate, nor will the pump lose prime, while drafting if the seal fails during pump operation.

Wear rings will be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.



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PUMP TRANSMISSION

The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength Morse HY-VO silent drive chain. By the use of a chain rather than gears, 50% of the sprocket will be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work.

Drive shafts will be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case will be designed to eliminate the need for water cooling.

PUMPING MODE

An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system will be designed to allow stationary pumping only.

AIR PUMP SHIFT

Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control will also be located on the left side pump panel.

Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump".

Another green indicator light will be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light will be labeled "Warning: Do not open throttle unless light is on".

The pump shift will be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements.

The pump shift control in the cab will be illuminated to meet NFPA requirements.

TRANSMISSION LOCK-UP

The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control in the cab is activated.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. The heat exchanger will be cylindrical type and will be a separate unit. The heat exchanger will be installed in the pump or



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engine compartment with the control located on the pump operator's control panel. Exchanger will be plumbed to the master drain valve.

INTAKE RELIEF VALVE

A Waterous relief valve, an integral part of the fire pump, will be installed on the suction side of the pump, preset at 125 psig .

Outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and an "intake pressure relief outlet - do not cap" warning tag.

Relief valve will have a working range of 50 psig to 250 psig.

A control mechanism to adjust the pressure will be located behind an access door at the right side pump panel.

PRESSURE GOVERNOR

This apparatus will be equipped with a Class1 "Total Pressure Governor" engine/pump governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The "Total Pressure Governor" is to operate as a pressure sensor (regulating) governor (PSG).

A special preset feature will permit a predetermined pressure of RPM to be set. The preset pressure or RPM will be displayed on the message display of the "Total Pressure Governor". The preset will be easily adjustable by the operator

The pressure sensor governor system will be operable only after the vehicle parking brake has been set, the transmission is the pumping mode, and the fire pump has been engaged.

The pressure sensor governor system will have two (2) modes of operation: pressure mode or rpm mode.

When in the pressure mode, the PSG system will automatically maintain the discharge pressure set by the operator regardless of flow (within engine/pump operating capabilities).

In the rpm mode, the PSG system will automatically maintain a set engine speed, regardless of engine load (within engine operation capabilities).

A pump cavitation protection feature will be provided which will return the engine to idle should the pump cavitate.

The pressure controller will incorporate monitoring for engine coolant temperature, oil pressure, and battery voltage.



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PRIMING PUMP

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of NFPA 1901.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control will open the priming valve and start the pump primer. The control will have a three position switch for automatic, off or test. In the sentry mode (automatic) the primer will sense when the pump losses discharge pressure and start the pump primer. The primer will automatically stop once the pump has pressure.

DRAINS- SPECIAL INSTRUCTIONS

All valves drains/bleeders will be tapped into the lowest point of each plumbing discharge and inlet. (This includes the ports on each valve as well).

THERMAL RELIEF VALVE

A Waterous Overheat Protection Manager (OPM) will be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump when the temperature of the pump water exceeds 140 Degrees F (60 C) and a red warning light that is triggered when the water in the pump reaches 180 F (82 C).

The warning light will act as an additional protection device if the temperature in the pump keeps rising after the valve opens. The warning light with a test switch will be mounted on the pump operator panel.

The discharge line will be plumbed to ground.

PUMP MANUALS

There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals will be provided by the pump manufacturer in the form of two (2) electronic copies. Each manual will cover pump operation, maintenance, and parts.

PLUMBING, STAINLESS STEEL AND HOSE

All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.



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Plumbing manifold bodies will be ductile cast iron or stainless steel.

All piping lines are to be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame.

All water carrying gauge lines will be of flexible polypropylene tubing.

All piping, hose and fittings will have a minimum of a 500 PSI hydrodynamic pressure rating.

FOAM SYSTEM PLUMBING

All piping that is in contact with the foam concentrate or foam/water solution will be stainless steel. The fittings will be stainless steel or brass. Cast iron pump manifolds will be allowed.

MAIN PUMP INLETS

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

MAIN PUMP INLET CAP

The main pump inlets will have National Standard Threads with a long handle chrome cap.

The cap will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.



INLET VALVES WITH INTAKE RELIEF VALVE

There will be Two (2) Akron Brass Revolution 7982 (30 degree swivel inlet) manually operated aluminum ball intake valve(s) provided right and left side .

The inlet connection will be 5.0" Storz with a cap and the outlet connection will be 6.0" FNST swivel long handle .

A 12.5" diameter handwheel will be included to operate valve open and close functions. A position indicator will be included to indicate position of the ball.

The ball intake valve will be equipped with an adjustable pressure relief valve. The relief valve will have a working range of 50 PSI to 250 PSI.

A 3/4" bleeder/drain valve will be provided on the ball intake valve to exhaust excess air or water from the valve.



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The Intake Valve will be constructed of lightweight, corrosion-resistant, hard-anodized aluminum and stainless steel. To protect against corrosion, the casting will be coated with a powder coat finish and all components on the wet side of the valve will be constructed from stainless steel.

SHORT SUCTION TUBE(S)

The suction tube(s) on the water pump will have short suction tube(s) installed to allow for installation of adapters, elbows or intake valves without excessive overhang.

VALVES

Three (3) full flow Waterous valves will be used for the side 2.50" discharges. All remaining ball valves, 3.00" or less, will be Akron Brass brand.

The Waterous valves will have a solid bronze ball that is chromium plated for a hard, durable surface. The spring loaded floating seal assembly requires no adjustment yet provides a tight seal against both pressure and vacuum pressures.

The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

LEFT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

RIGHT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the right side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

The location of the valve for the two (2) inlets will be recessed behind the pump panel.

INLET CONTROL

The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism will indicate the position of the valve.

INLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and



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provides excellent leverage. The water discharged by the bleeders will be routed below the chassis frame rails.

TANK TO PUMP

The booster tank will be connected to the intake side of the pump with stainless steel piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL

A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

LEFT SIDE DISCHARGE OUTLETS

There will be one (1) discharge outlet with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

RIGHT SIDE DISCHARGE OUTLETS

There will be two (2) discharge outlets with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

LARGE DIAMETER DISCHARGE OUTLET

There will be a 5.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with a 5.00" (M) National Standard hose thread adapter. This discharge outlet will be actuated with a handwheel control at the pump operator's control panel.

An indicator will be provided to show when the valve is in the closed position.

FRONT DISCHARGE OUTLET

There will be one (1) 2.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper.

Plumbing will consist of 2.50" piping and flexible hose with a 2.50" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 2.50" NST with 90 degree stainless steel swivel.

There will be automatic drains provided at all low points of the piping.



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DISCHARGE OUTLET (REAR)

There will be two (2) discharge outlets piped to the rear of the hose bed, Location will be one left and right side . Proper clearance will be provided for spanner wrenches or adapters. Plumbing will consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel. The discharge outlet(s) will terminate with a 2.50" male National Standard hose thread male adapter.

FRONT OF HOSE BED DISCHARGE OUTLET

There will be two (2) discharge outlets located at the front of the hose bed, on one (1) each side. Plumbing will consist of 2.00" piping with a 2.00" full-flow ball valve controlled at the pump operator's panel. The discharges will terminate with an 1.50" (M) NPSH adapter.

DISCHARGE CAPS/ INLET PLUGS

Chrome plated, rocker lug, caps with chain will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.

Chrome plated, rocker lug, plugs with chain will be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).

OUTLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

LEFT SIDE OUTLET ELBOWS

The 2.50" discharge outlets located on the left side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.



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RIGHT SIDE OUTLET ELBOWS

The 2.50" discharge outlets located on the right side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

ADDITIONAL REAR OUTLET ELBOWS

The 2.50" discharge outlets, located at the rear of the apparatus, will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

LARGE DIAMETER OUTLET ELBOWS

The 5.00" outlet will be furnished with a 5.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

ADAPTER, STORZ

There will be one (1) adapter with 5.00" Storz x 2.50" MNST with cap, installed passenger side large diameter.

DISCHARGE OUTLET CONTROLS

The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve.

If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

DELUGE RISER

A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be rigidly braced and installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel.

MONITOR (shipped loose)

An Akron #3423 Deluge with ground base, pipe and tips, #5160 Nozzle, #3505 Mounting Bracket, #3501 Direct mount Cover will be supplied.

The deluge riser will have male National Pipe Threads for mounting the monitor.



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CROSSLAY HOSE BEDS, 2.50"

Two (2) crosslays with 2.50" outlets will be provided. Each bed will be capable of carrying 200 feet of 2.50" double jacketed hose and will be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

The outlets will be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls will be at the pump operator's panel.

The center crosslay dividers will be fabricated of .25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish. The remainder of the crosslay bed will be painted job color.

Stainless steel vertical scuffplates will be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) will also be equipped with a stainless steel scuffplate.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

CROSSLAY/DEADLAY HOSE RESTRAINT

Elastic netting will be provided across the top and ends of two (2) crosslay/deadlay opening(s) to secure the hose during travel. The netting will be permanently attached at the top center of the crosslay/deadlay bed and removable on each end.

CROSSLAY ROLLER

A stainless steel roller will be mounted horizontally and vertically at each crosslay opening to aid in hose removal. The vertical rollers will be installed on the dividers and to the front and rear of the crosslays.

BOOSTER HOSE REEL

A Hannay electric rewind booster hose reel will be installed in the rear compartment.

The exterior finish of the reel will be painted #269 gray from the reel manufacturer.

Compartment floor will be covered with bright aluminum treadplate.

Roll-up door for this compartment will not interfere with the hose reel.

A polished stainless steel roller and guide assembly will be provided at the rear on each side so the booster hose does not rub against a painted surface.

Discharge control will be provided at the pump operator's panel. Plumbing to the reel will consist of 1.50" Aeroquip hose and a 1.50" valve.



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HOSE REEL BLOWOUT

A hose reel blowout will be furnished to blow out any remaining water from the hose reel. The blowout will be piped from the wet tank of the brake system to the hose reel and will be controlled at the pump operator's panel.

Reel motor will be protected from overload with a circuit breaker rated to match the motor.

An electric rewind control switch will be installed adjacent to the reel.

Booster hose, 1.00" diameter and 200 feet, with chrome plated Barway, or equal couplings will be provided. The hose will be divided in to three separate lengths of (1) 100' section and (2) 50' sections.

Working pressure of the booster hose will be a minimum of 800 psi.

Capacity of the hose reel will be 200 feet of 1.00" booster hose.

HOSE REEL BLOWOUT

one (1) hose reel blowout(s) will be furnished to blow out any remaining water from the reel(s). The blowout will be piped from the wet tank of the brake system to the reel, and will be controlled at the pump operator's panel.

FOAM SYSTEM

An Akron, Model 3126, foam eductor, with a capacity for 125 gpm, will be installed on the discharge side of the pump. Foam eductor will have a ball-type check valve to prevent water flow back into the foam agent line. Foam eductor will have a quarter-turn ball valve, for alternation between the bypass and the eductor.

The foam system will be a single agent system capable of handling class A foam concentrates as well as most class B foam concentrates.

The foam eductor will be plumbed to the front crosslay discharge.

Controls for the foam system will be located on the pump operator's panel and labeled with red tags for easy identification. The controls for the eductor, foam supply, and the flush will be electric over pneumatic to allow for an ergonomically designed control panel and simplified operation.

Provided with the system will be an instruction plate and plumbing schematic.

Push/pull handles for the foam system will be labeled with red tags for easy identification.



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All piping coming in direct contact with the foam concentrate will be immune to the concentrate, so deterioration of the plumbing will be avoided.

This system will have a bypass eductor type foam, with a rated capacity of 125 gpm at .25 percent .5 percent, 1 percent, 3 percent, and 6 percent.

Foam system operational considerations: 200 psi eductor inlet pressure will be required for proper operation.

FOAM TANK REFILL COVER

The foam tank dome cover will be hinged from the forward edge of the fill dome of the refill dome.

LABEL, FOAM CONTENT

A label will be provided on the foam tank fill dome. This label will be worded "Foam".

FOAM TANK

The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 30 gallons of foam with the intended use of Class B foam. The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN

The foam tank drain will be a 1.00" drain valve located inside the pump compartment accessible through a door on the right side pump panel.

PUMP COMPARTMENT

The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. The pump compartment will be constructed of the same material as the body compartmentation.

The pump compartment substructure will be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment will be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels will be removable from the chassis in a single assembly.



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PUMP MOUNTING

Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

LEFT SIDE PUMP CONTROL PANEL

All pump controls and gauges will be located at the left (driver's) side of the apparatus and properly identified.

Layout of the pump control panel will be ergonomically efficient and systematically organized.

The pump operator's control panel will be removable in two (2) main sections for ease of maintenance:

The upper section will contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels will be removable from the face of the pump panel for ease of maintenance. Below the sub panels will be located all valve controls and line pressure gauges.

The lower section of the panel will contain all inlets, outlets, and drains.

All push/pull valve controls will have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods will be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls will be capable of locking in any position. The control rods will pull straight out of the panel and will be equipped with universal joints to eliminate binding.

IDENTIFICATION TAGS

The identification tag for each valve control will be recessed in the face of the tee handle.

All discharge outlets will have color coded identification tags, with each discharge having its own unique color. Color coding will include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges will be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting will be removable from the face of the pump panel for ease of maintenance. The casting will be color coded to correspond with the discharge identification tag.

All remaining identification tags will be mounted on the pump panel in chrome plated bezels.



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The pump panel on the right (passenger's) side will be removable with lift and turn type fasteners.

Trim rings will be installed around all inlets and outlets.

PUMP PANEL CONFIGURATION

The left side and right side pump panel configurations will match those on 33960.

Option differences may be evident and an identical match is not possible. An as close as possible similarity will be the intent.

PUMP AND GAUGE PANEL

The pump and gauge panels will be constructed of stainless steel with a brushed finish. A polished aluminum trim molding will be provided on both sides of the pump panel.

The right side pump panel will be removable and fastened with swell type fasteners.

On the front of the pump house structure, provisions will be provided for access to the pump.

PUMP COMPARTMENT LIGHT

A pump compartment light will be provided inside the right side pump enclosure and accessible through a door on the pump panel.

A .125" weep hole will be provided in each light lens, preventing moisture retention.

PUMP PANEL GAUGES AND CONTROLS

The following will be provided on the pump and gauge panels in a neat and orderly fashion. These gauges will be in addition to what is provided with the pressure controller.

- Engine Oil Pressure Gauge: With visual and audible warning
- Engine Water Temperature Gauge: With visual and audible warning
- Tachometer: Electric
- Master Pump Drain Control
- Voltmeter
- Fuel

OK TO PUMP INDICATOR LIGHT

There will be a green indicator light installed on the pump operators panel that is activated when the pump is in Ok To Pump mode.



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COMPARTMENT IN RS PUMP PANEL

A compartment will be provided in the right side pump panel. A polished stainless steel access door will be provided.

SPECIAL LABEL

There will be two (2) special label/s provided and installed Passenger side rear 2.50" discharge & Driver side rear 2.50" discharge. Each label will be worded as follows, Passenger side rear 2.50" discharge & Driver side rear 2.50" discharge.

COLOR CODED NAME TAGS

There will be three (3) outlet discharges with special color coded name tags. These tags will be used for labeling the discharge pressure gauges, controls, outlets and drains. Passenger Rear 1.5" Preconnect = Aqua, Driver Rear 1.5" Preconnect = Light Green, Large Diameter Side Discharge = Blue.

TEST PORT

An electronic pump RPM test port will be provided.

VACUUM AND PRESSURE GAUGES

The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated ©.

The gauges will be a minimum of 6.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and polished stainless steel plugs. They will be marked with a label.

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges will be interlube filled and manufactured by Class 1©.

The gauges will be a minimum of 3.50" in diameter and will have white faces with black lettering.

Gauges will be compound type with a vacuum/pressure range of 30.00"-0-600#.



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The individual pressure gauge will be installed as close to the outlet control as practical.

WATER LEVEL GAUGE

There will be an Innovative Controls part number 3030385-01, 14-LED water level display provided on the pump operators gauge panel.

This water level display will indicate the following:

- Full with four (4) green horizontal LED lights on top.
- 3/4 full with three (3) amber horizontal LED lights in the second position from the top.
- 1/2 full with two (2) amber horizontal LED lights in the third position from the top.
- 1/4 full with one (1) amber LED light in the fourth position from the top.
- Empty with four (4) red horizontal LED lights in the bottom position.

FOAM LEVEL GAUGE

There will be an Innovative Controls part number 3030386-01B, 14-LED foam level display labeled for Class B foam provided on the pump operators gauge panel.

This foam level display will indicate the following:

- Full with four (4) green horizontal LED lights on top.
- 3/4 full with three (3) amber horizontal LED lights in the second position from the top.
- 1/2 full with two (2) amber horizontal LED lights in the third position from the top.
- 1/4 full with one (1) amber LED light in the fourth position from the top.
- Empty with four (4) red horizontal LED lights in the bottom position.

LIGHT SHIELD

There will be a polished, 16 gauge stainless steel light shield will be installed over the pump operators panel.

- There will be three (3) On Scene Solutions Night Axe, Model 70005, 18.00" LED lights installed under the stainless steel light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.
- One (1) pump panel light will come on when the pump is in ok to pump mode.

There will be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel.



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AIR HORN SYSTEM

There will be two (2) Grover air horns recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

Air Horn Location

The air horns will be located on each side of the bumper, just outside of the frame rails.

AIR HORN CONTROL

The air horns will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

AUXILIARY MECHANICAL SIREN

A Federal Q2B® siren will be furnished. A siren brake button will be installed on the switch panel.

The control solenoid will be powered up after the emergency master switch is activated.

The mechanical siren will be mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

The mechanical siren will be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

GROUND STRAP FROM Q2B TO GROUND STUD

A ground wire will be added to the Q2B siren. The ground wire will run from the siren motor to the ground stud below the bumper deckplate.

FRONT ZONE UPPER WARNING LIGHTS

There will be a 92.00" Whelen® Freedom™ IV lightbar mounted on the cab roof.

The lightbar will include the following:

- One (1) red flashing LED module in the left side end position.
- One (1) red flashing LED module in the left side front corner position.
- One (1) red flashing LED module in the left side first front position.
- Open in the left side second front position.
- One (1) white flashing LED module in the left side third front position.
- One (1) red flashing LED module in the left side fourth front position.
- Open in the left side fifth front position.
- One (1) red flashing LED module in the left side sixth front position.



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- One (1) white flashing LED module in the left side seventh front position.
- One (1) 795 LED traffic light controller set to national standard high priority in the left side center front positions.
- One (1) white flashing LED module in the right side seventh front position.
- One (1) red flashing LED module in the right side sixth front position.
- Open in the right side fifth front position.
- One (1) red flashing LED module in the right side fourth front position.
- One (1) white flashing LED module in the right side third front position.
- Open in the right side second front position.
- One (1) red flashing LED module in the right side first front position.
- One (1) red flashing LED module in the right side front corner position.
- One (1) red flashing LED module in the right side end position.

There will be clear lenses included on the lightbar.

The following switches may be installed in the cab on the switch panel to control the lightbar:

- a switch to control the flashing LED modules
- the traffic light controller will be by a cab switch with emergency master control
- there will be no momentary switch to activate the traffic light controller

The white flashing LEDs and the traffic light controller will be disabled when the parking brake is applied.

The six (6) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

CAB FACE WARNING LIGHTS

There will be four (4) Whelen®, Model M6*, LED flashing warning lights installed on the cab face, above the headlights, mounted in a common bezel.

- The driver's side front outside warning light to be red
- The driver's side front inside warning light to be white
- The passenger's side front inside warning light to be white
- The passenger's side front outside warning light to be red

All four (4) lights will include a colored lens that is the same color of the LED's.

There will be a switch located in the cab, on the switch panel, to control the four (4) lights.



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The inside lights may be load managed if colored or disabled if white, when the parking brake is set.

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash. This switch will be live when the battery switch and the emergency master switches are on.

The flashing will automatically cancel when the headlight (high or low beam) switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING

There will be six (6) Whelen®, Model M6**, 4.31" high x 6.75" long x 1.37" deep flashing LED warning lights with chrome trim installed per the following:

- Two (2) lights located, one (1) each side on the bumper extension. The driver's side, side front light to include red warning LEDs and the passenger's side, side front light to include red warning LEDs.
- Two (2) lights located, one (1) each side of cab rearward of crew cab doors. The driver's side, side middle light to include blue warning LEDs and the passenger's side, side middle light to include blue warning LEDs.
- Two (2) lights located, one (1) each side above rear wheels. The driver's side, side rear light to include red warning LEDs and the passenger's side, side rear light to include red warning LEDs.
- The warning light lens colors to be the same as the LEDs.

There will be a switch in the cab on the switch panel to control the lights.

SIDE WARNING LIGHTS

There will be one (1) pair of Whelen, Model M6* LED flashing lights provided.

The lights will be located on the cab corner each side and will be activated with the side warning switch.

The color of the lights will be red Super LED/red lens.

The lights will be mounted on a 45 degree angled forward polished stainless steel bezels.

Any white light will terminate when the parking brake is applied.



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REAR ZONE LOWER LIGHTING

Two (2) Whelen, Model M6* LED flashing warning lights with bezels will be located at the rear of the apparatus.

The driver's side rear light to be red.

The passenger's side rear light to be blue.

Both lights will include a lens that is the same color as the LED's.

There will be a switch located in the cab on the switch panel to control the lights.

REAR OF HOSEBED WARNING LIGHTS

There will be two (2) Whelen, Model B6M7**1P Super LED beacon with lower LED flashing warning lights provided at the rear of the truck, one (1) each side.

Each light will include a Super LED flashing beacon and a Whelen, Model M7* LED flashing light, mounted in a polished aluminum housing.

The beacons will have red LEDs and be provided with both domes red.

The color of the Whelen, Model M7* LED flashing lights will be amber and include a lens that is the same color as the LED's .

A switch will be provided in the cab, on the switch panel to control the beacons. The lower Whelen, M7* LED lights will be activated with the rear upper warning switch.

The rear warning lights will be mounted on stainless steel brackets with all wiring totally enclosed. These brackets will also support the clearance/marker lights.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen® Model TAL85 46.87" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The lens color will be the same color as the LED's.

The control head will be included with this installation. The control head will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be recessed with a stainless steel trim plate at the rear of the apparatus as high as practical.



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The traffic directing light controller will be located within the overhead recessed console above the engine tunnel on the driver's side.

CUP HOLDER

A cup holder will be provided for the Two (2) to securely hold the push-up pole in place while in the lower position.

POWER OUTLET STRIP

There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided 120 volt receptacle that the power stripe plugs into will be located behind the drive seat recessed in side wall, power stripe will be ran thru the crew cab floor rear od engine tunnel and coiled loose with final install by the Customer - see photo.

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 5.9.3 and 5.9.4 will be provided by the fire department.

- 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) smoothbore of combination nozzle with 2.50" shutoff that flows a minimum of 250 gpm.



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- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) combination spanner wrenches.
- Two (2) hydrant wrenches.
- One (1) double female 2.50" (65 mm) adapter with National Hose threads.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads.
- One (1) rubber mallet, for use on suction hose connections.
- Two (2) salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m).
- One (1) 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 (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- Four (4) ladder belts meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components* (if equipped with an aerial device).
- 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, will be carried mounted in brackets fastened to the apparatus.
- 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 will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6.
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to



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allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

SOFT SUCTION HOSE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.8.2.1 requires a minimum of 20' of suction hose or 15' of supply hose will be carried.

Hose is not on the apparatus as manufactured. The fire department will provide suction or supply hose.

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:



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7. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
8. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion. A final pure water rinse will be applied to all metal surfaces.
9. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
10. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
11. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.
12. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.
13. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacture.

Each batch of basecoat color is checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color is verified again to make sure that it matches the color standard. Electronic color measuring equipment is used to compare the color sample to the color standard entered into the computer. Color specifications are used to determine the



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color match. A Delta E reading is used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

Pierce Manufacturing paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) meet or exceed the Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels meet or exceed the #6 A.C.T. standard in critical areas. These requirements are met in order for the exterior paint finish to be considered acceptable. The Pierce Manufacturing written paint standards will be available upon request.

The cab and the body will be painted #20 white.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.



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GALVANIZED CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be hot dip galvanized before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be hot dip galvanized are:

- Frame rails
- Cross members
- Front frame extension

All galvanized components are inspected for compliance with ASTM specifications.

Battery boxes will be stainless steel.

All components that are not galvanized will be painted primer and gloss black paint.

HOT DIP GALVANIZED WATER TANK CRADLE

The water tank cradle will be treated through a hot dip galvanizing process. The cradle will be immersed in molten zinc to provide a coating that will help protect against the effects of corrosion.

Hardware to assemble galvanized components will be Dacromet® coated.

COMPARTMENT INTERIOR PAINT

The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, will be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.



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This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

OUTLINE, REFLECTIVE STRIPE

A Black outline will be applied on the top and the bottom of the reflective band. There will be one (1) set of outline stripes required.

INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS

There will be alternating chevron striping located on the inside of each cab and crew cab door.

The striping will consist of the following colors:

The first color will be black

The second color will be gold

The size of the striping will be 4.00".

LETTERING

Forty-one (41) to sixty (60) reflective lettering, 3.00" high, with outline will be provided.

LETTERING, SCRIPT

Script lettering shall be provided on the rear body compartment door. The lettering will state "Everyone Comes Home".

EMBLEMS

There will be two (2) monogram emblem(s) installed on the front cab doors , with "DENVER" above the monogram and "FIRE DEPT." below the monogram.

The monogram and lettering will be made of gold reflective material with black outline.

The design will be the same as on previous units.

EMBLEMS

There will be a pair of American flag emblems, installed on the rear crew cab windows . The emblem will be waving and made out of Gerber Vision material.

EMBLEM

There will be one (1) emblem(s), approximately 24.00" - 25.00" wide in size, installed R1. The emblem will feature a "Flying American Flag" and an "Eagle Head".



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MANUAL, FIRE APPARATUS PARTS

Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

One (1) compact disc (CD) will also be provided that will include all of the information from the above manual.

The manual will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate parts

The manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website.

The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes



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- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals will be provided.

MANUALS CHASSIS ENGINE

Engine trouble shoot and parts manuals will be provided.

MANUALS, CHASSIS TRANSMISSION

Transmission service and parts manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this document.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce custom chassis limited warranty certificate, WA0284, is included with this document.

ENGINE WARRANTY

A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this document.

STEERING GEAR WARRANTY

A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.



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FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included with this document.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this document.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this document.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor WabcoTMABS brake system limited warranty certificate, WA0232, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this document.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this document.

CAMERA SYSTEM WARRANTY

A Pierce fifty four (54) month warranty will be provided for the camera system.

COMPARTMENT LIGHT WARRANTY

The compartment lights will not offer an extended warranty.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.



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TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

WATER TANK WARRANTY

A UPF poly water tank limited warranty certificate, WA0195, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce apparatus body limited warranty certificate, WA0009, is included with this document.

PUMP WARRANTY

A Waterous pump limited warranty certificate, WA0225, is included with this document.

TEN (10) YEAR PUMP PLUMBING WARRANTY

The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this document.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

The Pierce graphics fading and deterioration limited warranty limited warranty certificate, WA0168, is included with this document.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of bid.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.



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CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer will provide a cab integrity certification with this document. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Roof Crush

The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

Additional Roof Crush

The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

Side Impact

The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact

The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact

The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420).

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.



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WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 75 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.



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CAB AIR CONDITIONING PERFORMANCE CERTIFICATION

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 67 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar air conditioning system has been tested and has met these criteria. The certification will be available at the time of delivery.

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
 - The nameplate rating of the alternator.
 - The alternator rating under the conditions specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - The minimum continuous load of each component that is specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - Additional loads that, when added to the minimum continuous load, determine the total connected load.
 - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).

Exhibit A



FRONT RANGE FIRE APPARATUS

7600 Miller Court
Frederick, CO 80504
303-449-9911
1-800-334-9911
www.FrontRangeFire.com

DUANE DOUCETTE
303-304-6118
DuaneD@frontrangefire.com



PERFORM. LIKE NO OTHER.™

FOR FURNISHING FIRE APPARATUSJanuary 01, 2020City and County of Denver

The undersigned is prepared to manufacture for you, upon an order being placed by you, for final acceptance by Front Range Fire Apparatus., at its home office in Frederick, Colorado, the apparatus and equipment herein named and for the following prices:

(1) Pierce Velocity Ascendant Ladder per attached component list **\$1,167,175.00**
Delivery is approximately 14 months w/Cummins 12 Engine

Option 1: Make Chassis Pre-Payment of \$449,120.00
Due in Net 30 Days of Signed Contract **Deduct (\$13,473.00)**

Option 2: Make 100% Prepayment of \$1,117,175.00
Due in Net 30 Days of Signed Contract **Deduct (\$50,000.00)**

Total \$ _____

Said apparatus and equipment are to be built and shipped in accordance with the specifications hereto attached, delays due to strikes, war, or intentional conflict, failures to obtain chassis, materials, or other causes beyond our control not preventing, within about 14 months after receipt of this order and the acceptance thereof at our office at Frederick, Colorado, and to be delivered to you Denver, CO

The specifications herein contained shall form a part of the final contract, and are subject to changes desired by the purchaser, provided such alterations are interlined prior to the acceptance by the company of the order to purchase, and provided such alterations do not materially affect the cost of the construction of the apparatus.

The specification for fire apparatus conforms with all Federal Department of Transportation (DOT) rules and regulations in effect at the time of bid, and with all National Fire Protection Association (NFPA) Guidelines for Automotive Fire Apparatus as published at the time of bid, except as modified by customer specifications. Any increased costs incurred by first party because of future changes in or additions to said DOT or NFPA standards will be passed along to the customers as an addition to the price set forth above.

Unless accepted within 30 days from date, the right is reserved to withdraw this proposition.

FRONT RANGE FIRE APPRATUS.

By: _____
 Duane Doucette
 SALES REPRESENTATIVE





Option List

12/11/2019

Customer:	Denver Fire Department	Bid Number:	964
Representative	Doucette, Duane	Job Number:	
Organization:	Front Range Fire Apparatus, Ltd	Number of Units:	1
Requirements Manager:		Bid Date:	12/01/2019
Description:	Aerial 107' Ascendant, Velocity	Stock Number:	
Body:	Aerial, HD Ladder 107' ASL Tandem, PUC, Alum Body	Price Level:	38 (Current: 38)
Chassis:	Velocity Chassis, Aerials, Tandem Axle, Ascendant PUC (Big Block), 2010	Lane:	

Line	Option	Type	Option Description	Qty
1	0766640		Boiler Plates, Aerial 107' ASL Fire Department/Customer - Denver Fire Department Operating/In conjunction W-Service Center - Operating Miles - 25 Miles Number of Fire Dept/Municipalities - 25 Bidder/Sales Organization - Front Range Fire Apparatus Delivery - Delivery representative Dealership/Sales Organization, Service - Front Range Fire Apparatus	1
2	0018180		Single Source Compliance, Aerials	1
3	0584456		Manufacture Location, Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0670275		Unit to be Similar in some Aspects, Excluding Pump Panel Fill in Blank - Velocity 105' ladder job #29636 in some aspects, pictures provided	1
7	0610784		Comply NFPA 1901 Changes Effective Jan 1, 2016, With Exceptions	1
8	0533349		Aerial Fire Apparatus	1
9	0588612		Vehicle Certification, Aerial w/Pump	1
10	0681278		Agency, Apparatus Certification, Aerial w/Pump, U.L.	1
11	0799172		FLEET CUSTOMER	1
12	0620362		Consortium, HGAC	1
13	0537375		Unit of Measure, US Gallons	1
14	0030006		Bid Bond Not Requested	1
15	0582800		Performance Bond, 100 Percent w/25 Percent Warranty Bond, 1 Yr, and Payment Bond	1
16	0000007		Approval Drawing	1
17	0611571	SP	Drawing, As Built, At Delivery a Revised Print w/ Changes, FLEET	1
18	0002928		Electrical Diagrams	1
19	0786877		Velocity Chassis, Aerials, Tandem Axle, Ascendant PUC (Big Block), 2010	1
20	0021007		Maximum Overall Height Size - 11'-6"	1
21	0000110		Wheelbase Wheelbase - 250.50"	1
22	0000070		GVW Rating GVW rating - 70,800 pounds	1
23	0000203		Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/DCF	1
24	0756525		Frame Liner, Internal "C" 12.50" x 3.00" x .25", XT/Vel/Imp, Full Length, 56"Qv	1
25	0508849		Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel	1
26	0010427		Suspension, Front TAK-4, 22,800 lb, Qtm/AXT/Imp/Vel/DCF/Enf	1
27	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	1
28	0000322		Oil Seals, Front Axle	1
29	0594821		Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply	1
30	0019611		Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot	1
31	0530478		Axle, Rear, Meritor RT46-160, 48,000 lb, Imp/Vel/DCF	1
32	0671918	SP	Axle Ratio, Rear Axle, (6.14), Electronically Limited Top Speed, 60mph	1
33	0555353		Suspen, Rear, Hendrickson FMX 482 EX, Air Ride, 48,000 lb	1
34	0000485		Oil Seals, Rear Axle	1
35	0000483		Driver Controlled Differential Lock, Rear Axle, Tandem	1
36	0587016		Tires, Rear, Goodyear, G622 RSD, 12R22.50, 16 ply, Tandem	1
37	0019639		Wheels, Rear, Alcoa, 22.50" x 8.25", Aluminum, Hub Pilot, Tandem	1

Line	Option	Type	Option Description	Qty
38	0642999		Tire Balancing, Nothing Required	1
39	0620569		Tire Pressure Monitoring, RealWheels, AirSecure, Valve Cap, Tandem Axle	1
			Qty, Tire Pressure Ind - 10	
40	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1
41	0002045		Mud Flaps, w/logo front & rear	1
42	0021931		Tire, "Crossfire" Air Pressure Equalization (tandem)	1
43	0031931		Valve, Extension Stabilizer System, Rear Duals	1
44	0601010		Chocks, Wheel, SAC-44-E, Folding, Aerials	1
			Qty, Pair - 01	
45	0601009		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal, Aerials	1
			Qty, Pair - 01	
			Location, Wheel Chocks - Left Side Rear Tire, Forward	
46	0593759		ESC/ABS/ATC Wabco Brake System, Tandem Rear Axle, 2010	1
47	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
48	0000730		Brakes, Meritor, Cam, Rear, 16.50 x 7.00"	1
49	0020784		Air Compressor, Brake, Cummins/Wabco 18.7 CFM	1
50	0000789		Brake Reservoirs, Five	1
51	0587033		Air Dryer, Brake, AD-9 w/heat, 2010	1
52	0000790		Brake Lines, Nylon	1
53	0000854		Air Inlet, w/Disconnect Coupling	1
			Location, Air Coupling(s) - a) DS Step Well, Rearward	
			Qty, Air Coupling (s) - 1	
54	0000860		Outlet, Air, with shut off valve	1
			Location, Air Coupling(s) - o) DS Frt Body Compt	
			Qty, Air Coupling (s) - 1	
55	0004200		Hose, Air 25' length, w/air chuck	2
			Qty, - 02	
56	0070810		All Wheel Lockup (Aerial/Tanker Chassis)	1
57	0014130		Air Tank, Additional for Extra Air Horn Capacity	1
58	0612549		Fittings, Compression Type, Entire Apparatus, Tandem Rear Axle	1
59	074053	SP	Engine, Cummins X12, 500 hp, W/OBD, EPA 2018, REPTO, Vel,	1
60	0001244		High Idle w/Electronic Engine, Custom	1
61	0678027		Engine Brake, Jacobs Compression Brake, Cummins Engine, with Allison Retarder	1
			Switch, Engine Brake - d) ISC/ISM/ISL/ISL9/ISX, Hi Lo	
62	0607623	SP	Clutch, Fan, Air Actuated, Horton Drive Master, Compression Fitting	1
63	0123135		Air Intake, w/Ember separator, Imp/Vel	1
64	0565965		Exhaust System, 5", 2010 DD13, ISX engine, Horizontal, Right Side	1
65	0688512	SP	Exhaust, 35 Degree w/modified end for extraction system, Approval Req'd	1
66	0787999		Radiator, Impel/Velocity	1
67	0612334	SP	Cooling Hoses, Gates Silicone, To include .25" Surge Tank	1
68	0014124		Skid Plate, Radiator, All Custom Chassis	1
69	0673756		Winter Cover With Ventilation, Front Cab Grille, One Piece, Vel	1
			Color, Vinyl Cover - d) White	
70	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1
71	0001129		Lines, Fuel	1
72	0595087		DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	1
			Door, Material & Finish, DEF Tank - Polished Stainless	
73	0552777		Fuel Pump for Repriming	1
74	0582243		Shutoff Valves, Fuel Line @ Primary Filter, Cummins	1
75	0553019		Cooler, Engine Fuel, Imp/Vel, AXT/Qtm/Sab/DCF/SFR/Enf	1
76	0578959		Fuel/Water Separator, Racor Inline	1
77	0642591		Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Dash CF	1
			Trans. retarder capacity - e. medium/1600, 4000 EVS	
			Trans. retarder control - l) Auto 1/3, 2/3, 3/3	
78	0625331		Transmission, Shifter, 6-Spd, Push Button, 4000 EVS	1
79	0517604		Transmission Programming, Park to Neutral, PUC	1
80	0797408		Transmission Oil Cooler, Modine, External, w/Modine External Sump	1
81	0535530		Mode, Downshift, Aggressive downshift to 2nd, w/engine brake, 6 speed	1
82	0565656		Fluid, 4000/4500 Series Transmission, TranSynd synthetic, IPOS, Custom	1
83	0001375		Driveline, Spicer 1810	1
84	0669988		Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	1

Line	Option	Type	Option Description	Qty
85	0001544		Not Required, Steering Assist Cylinder on Front Axle	1
86	0509230		Steering Wheel, 4 Spoke without Controls	1
87	0690274		Logo/Emblem, on Dash	1
			Text, Row (1) One - Denver	
			Text, Row (2) Two - Fire	
			Text, Row (3) Three - Department	
88	0034671		Lube System, Vogel, 22 Point, w/TAK-4 Suspension	1
			Location - reservoir will be in between the boom supports	
89	0123624		Bumper, 16" Extended, Imp/Vel	1
90	0616467		Tray, Tool, Center, 16" Bumper, Outside Air Horns, Imp/Vel	1
			Grating, Bumper extension - Grating, Rubber	
91	0617307		Cover, Aluminum Treadplate, Two (2) Flush Lift and Turn Latches, Tool Tray	1
			Stay arm, Tray Cover - b) Pneumatic Stay Arm	
92	0510226		Lift & Tow Package, Imp/Vel, AXT, Dash CF	1
93	0522573		Tow Hooks Not Required, Due to Lift and Tow Package	1
94	0777637		Cab, Velocity FR, 7010 Raised Roof w/Deep Notch, PUC	1
95	0667982		Engine Tunnel, ISX, Impel/VelocitY FR	1
96	0677478		Rear Wall, Exterior, Cab, Aluminum Treadplate	1
97	0122466		Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	1
98	0123176		Grille, Bright Finished, Front of Cab, Impel/VelocitY	1
99	0002224		Scuffplates, S/S At Cab Door Jambs, 4-Door Cab	1
			Material Trim/Scuffplate - c) S/S, Polished	
100	0527032		Trim, S/S Band, Across Cab Face, Rect Lights, Velocity	1
			Material Trim/Scuffplate - b) S/S, Brushed	
			Turnsignal Covers - No Covers	
101	0087357		Molding, Chrome on Side of Cab	1
102	0559130		Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven	1
			Finish, Arm Cover - Chrome	
			Finish, Mirror Head - Chrome	
103	0667937		Door, Full Height, Velocity FR 4-Door Cab, Raised Roof	1
			Key Model, Cab Doors - 751	
104	0655511		Door Panel, Brushed Stainless Steel, Impel/VelocitY 4-Door Cab	1
105	0667905		Storage Pockets w/ Elastic Cover, Recessed, Impel/VelocitY FR	1
106	0667902		Controls, Electric Windows, All Cab Doors, Impel/VelocitY FR	1
107	0555485		Steps, 4-Door Full Tilt Cab, Imp/Vel	1
108	0770194		Handrail, Exterior, Knurled, Alum, 4-Door Cab	1
109	0509649		Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per Step	1
110	0002140		Fenders, S/S on Cab	1
111	0122479		Window, Side of C/C, Fixed, Velocity	1
112	0552935		Trim, Cab Side Windows, Velocity	1
113	0012090		Not Required, Windows, Front/Side of raised roof	1
114	0509286		Not Required, Windows Rear of Crew Cab, Imp/Vel	1
115	0558334		Not Required, Trim, Cab Rear Windows, No Rear Windows	1
116	0748671		Cab Interior, Vinyl, Velocity FR, CARE	1
			Color, Cab Interior Vinyl/Fabric - Endure Vinyl - Silver/Gray	
117	0667943		Cab Interior, Paint Color, Impel/VelocitY FR	1
			Color, Cab Interior Paint - a) gray	
118	0509532		Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	1
119	0667936		Heater/defroster, Dual Zone Control, Impel/VelocitY FR	1
120	0750608	SP	Air Conditioning, Dual Zone Control, Sp Condenser, Impel/VelocitY FR	1
			Paint Color, A/C Condenser - Painted by OEM	
121	0028432		Brush Guard/Cover, Air Conditioning Condenser, 4-way, Cab Roof Aerial	1
122	0639675		Sun Visor, Smoked Lexan, AXT, Dash CF, Imp/Vel, Saber FR/Enforcer	1
			Sun Visor Retention - No Retention	
123	0548173		Grab Handles, Driver and Passenger Door Post, Imp/Vel	1
124	0002526		Light, Engine Compt, All Custom Chassis	1
125	0122516		Fluid Check Access, Imp/Vel	1
126	0583042		Side Roll and Frontal Impact Protection	1
127	0622617		Seating Capacity, 6 Seats	1
128	0697005		Seat, Driver, Pierce PS6, Premium, Air Ride, High Back, Safety	1
129	0696994		Seat, Officer, Pierce PS6, Premium, Air Ride, SCBA, Safety	1
130	0656795		Radio Compartment, Behind Officer Air Ride SCBA Seat, Imp/Vel	1

Line	Option	Type	Option Description	Qty
131	0122183		Seat, Rear Facing C/C, DS Outboard, Pierce PS6, Premium, SCBA, Safety	1
132	0102783		Not Required, Seat, Rr Facing C/C, Center	1
133	0122186		Seat, Rear Facing C/C, PS Outboard, Pierce PS6, Premium, SCBA, Safety	1
134	0108189		Not Required, Seat, Forward Facing C/C, DS Outboard	1
135	0122744		Seat, Forward Facing C/C, Center, (2) Pierce PS6, Premium, SCBA, Safety	1
136	0108190		Not Required, Seat, Forward Facing C/C, PS Outboard	1
137	0511300		Upholstery, Seats In Cab, All Imperial 1200, Pierce PS6	1
			Color, Cab Interior Vinyl/Fabric - h) Gray/Black	
138	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats	5
			Qty, - 05	
139	0603867		Seat Belt, ReadyReach	1
			Seat Belt Color - Red	
140	0604864		Seat Belt Height Adjustment, 5 Seats, Imp/Vel, Dash CF	1
141	0543133		Bracket, Helmet Holder, Zico UHH-1	1
			Qty, Helmet Storage Brkt - 5	
142	0647638		Lights, Dome, Weldon Dual LED 4 Lts	1
			Color, Dome Lt - Red & White	
			Color, Dome Lt Bzl - Grey	
			Control, Dome Lt White - Door Switches and Lens Switch	
			Control, Dome Lt Color - Lens Switch	
143	0631779		Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk EX	1
			12vdc power from - Battery switched	
144	0650352		Spotlight, Golight Stryker, Model 30**4, LED, 2 Lts	1
			Location - one each side	
			Color, GoLt - White	
			Bracket, Spotlight - Pedestal - 2 Lts	
145	0650059		Controller, Spotlight, Golight Stryker, Wired Dash Mount, 2 Lts	1
146	0621826		Location, Spotlight Controller, Driver Overhead and Officer Overhead, 2 Lts	1
147	0000000	STF	Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v, Orange	1
			Location, Portable Hand Light - shipped loose	
148	0568369		Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Veloccity 2010, Dash CF	1
149	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	1
150	0543751		Light, Do Not Move Apparatus	1
			Alarm, Do Not Move Truck - Pulsing Alarm	
151	0509042		Messages, Open Door/Do Not Move Truck, MUX w/Color Display	1
152	0611681		Switching, Cab, Membrane, Impel/Veloccity/Quantum, Dash CF, AXT WiFi MUX	1
			Location, Emerg Sw Pnl's - Driver's Side Overhead	
153	0555915		Wiper Control, 2-Speed with Intermittent, MUX, Impel/Veloccity	1
154	0002565		Hourmeter, Aerial Inside Cab	1
155	0002615		Switch, Aerial 12V Master	1
156	0002617		PTO switch, w/light - aerial	1
157	0548006		Wiring, Spare, 15 A 12V DC 2nd	1
			Qty, - 01	
			12vdc power from - Battery direct	
			Wire termination - 15 amp power point plug	
			Location - on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical recessed - See Pictures	
158	0548009		Wiring, Spare, 20 A 12V DC 1st	1
			Qty, - 01	
			12vdc power from - Battery direct	
			Wire termination - Butt Splice	
			Location, Spare Wiring - in the electronics box over the engine behind panel #9 rearward	
159	0548004		Wiring, Spare, 15 A 12V DC 1st	4
			Qty, - 04	
			12vdc power from - Battery direct	
			Wire termination - Butt Splice	
			Location, Spare Wiring - Engine Tunnel - Officer's Side	
160	0566101		Recess, Dash Panel, Officer Side, Vel/Imp	1
161	0615386		Vehicle Information Center, 7" Color Display, Touchscreen, MUX	1
			System Of Measurement - US Customary	
162	0606247		Vehicle Data Recorder w/CZ Display Seat Belt Monitor	1

Line	Option	Type	Option Description	Qty
163	0003757		Antenna, Std and Add'l Mts Only, 2-way Radio,Cust,Spl Cable Routing Location - routed to the office seat box Qty, - 01 Location 1 - routed to the office seat box	1
164	0653526		Camera, Pierce, Driver Mux, Rear Camera Only Camera System Audio - Not Provided	1
165	0615100		Pierce Command Zone, Advanced Electronics & Control System, Diag LEDs, Vel, WiFi	1
166	0624254		Electrical System, Velocity	1
167	0604825	SP	Batteries, (5) Exide Grp 31, 750 CCA each, Threaded Stud	1
168	0008621		Battery System, Single Start, All Custom Chassis	1
169	0123174		Battery Compartment, Imp/Vel	1
170	0579436		Charger, Sngl Sys, Kussmaul, 1200, 091-187-12-Remote, 40 Amp Bar Display	1
171	0012782		Location, Charger, Front Left Side Body Compartment Location, Battery Chrgr/Cmpr - High On Back Wall	1
172	0531403		Location, Bat Chrg Ind, Driver's Seat with Bracket	1
173	0016856		Shoreline, 15A 120V, Kussmaul Auto Eject, 091-55-15-120, Super Qty, - 01 Color, Kussmaul Cover - d) yellow Connection, Shoreline - the battery charger and six place receptacle in the cab	1
174	0026800		Shoreline Location Location, Shoreline(s) - DS Rear bulkhead	1
175	0529667		Cover, Protection Battery Box IO Modules	1
176	0566294		Alternator, 430 amp, Niehoff C680-1	1
177	0603291	SP	Open Weather Pack Connections Plugged W/Weather Pack Connectors	1
178	0002860	SP	Sealer (Gorp), No Gorp Req'd on Elect Connections, Denver only	1
179	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - e)High Idle enable	1
180	0648716		Headlights, Rectangular Halogen, Imp/Vel	1
181	0648425		Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF Color, Lens, LED's - m)match LED's	1
182	0781760	SP	Light, Dir/Mark, Intrm, Truck-Lite 30375Y LED Grm Mt 4lts, Over 30' MUX	1
183	0648074		Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	1
184	0090155		Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	1
185	0602938		Light, Marker End Outline, Rubber Arm, LED Marker Lamp, Rear Body Qty, Lights, Pair - 1	1
186	0551870		Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir w/Flange Color, Lens - Colored	1
187	0551758		Lights, Backup, WIn M6BUW, LED, Flange Feature Flange Kit - w)with flange	1
188	0664466		Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp Under Tailbrd Location - driver side	1
189	0589905		Alarm, Back-up Warning, PRECO 1040	1
190	0763690		Indicator, Back-up Warning, Ultrasonic 4-zone Location - next to driver, see customer marked up IP layout	1
191	0695735		Lights, Perimeter Cab, Truck-Lite 44310C LED Cab, Perimeter Scene - Cab, 4dr Custom	1
192	0617874		Lights, Perimeter Pump House, Truck-Lite 44310C LED 2lts	1
193	0615864		Lights, Perimeter Body, Truck-Lite 44308C LED 1lt, Turntable Access Control, Perimeter Lts - Parking Brake Applied	1
194	0589378		Lights, Step, P25 LED, Aerial With Pump, Ign, Park Brake Set	1
195	0612106	SP	Light, Visor, WIn, 12V PSL2* Pioneer LED Spotlt, Deep Notch Cab 1st Qty, - 01 Location, driver's/passenger's/center - Centered Switch, Lt Control 1 DC,1 - a) DS Switch Panel Switch, Lt Control 2 DC,2 - g) PS Switch Panel Switch, Lt Control 3 DC,3 - d) No Control Color, WIn Lt Housing - White Paint	1
196	0645681		Lights, Not Required, Rear Work, Deck Lights At Rear	1
197	0645687		Lights, Rear Scene, WIn, M6ZC LED, 1st Qty, - 02 Control, Rear Scene Lts - Cab Switch Panel DS	2

Line	Option	Type	Option Description	Qty
197			Location, Scene Lights - DS Rear Body Bulkhead, High, 1lt and PS Rear Body Bulkhead, High, 1lt	
198	0774948		Lights, Wln, P*H1* Pioneer, 12 VDC, 2nd	1
			Location - high and rearward of passenger side crew cab door	
			Qty, - 01	
			Color, Wln Lt Housing - White Paint	
			Control, Scene Lts - Cab Sw Panel DS	
			Scene Light Optics - flood	
			Mount, Wln II - Semi-recessed 15 deg P**1	
199	0775524		Lights, Wln, P*H1* Pioneer, 12 VDC, 1st	1
			Location - high and rearward of driver's side crew cab door	
			Qty, - 01	
			Color, Wln Lt Housing - White Paint	
			Control, Scene Lts - Cab Sw Panel DS	
			Scene Light Optics - flood	
			Mount, Wln II - Semi-recessed 15 deg P**1	
200	0631374		Lights, Deck, Wln (2) MPPBCS Micro Pioneer LED Rear Flood Lights	1
			Control, Scene Lts - Sw Included on Light	
201	0645675		Lights, Not Required, Hose Bed, Alt. Pole Lights On Back Of Cab/In Pump House	1
202	0709438		Light, Walking Surf, FRP Flood, LED	1
203	0788426		Aerial, HD Ladder 107' ASL Tandem, PUC, Alum Body	1
204	0554269		Body Skirt Height, 18"	1
205	0552509		Tank, Water, 300 Gallon, Poly, Ascendant Tandem, PAL, PAP, PUC	1
206	0003405		Overflow, 4.00" Water Tank, Poly	1
207	0028107		Not Required, Foam Cell Modification	1
208	0553729		Not Required, Restraint, Water Tank, Heavy Duty	1
209	0003429		Not Required, Direct Tank Fill	1
210	0751747		Hose Bed, Aluminum, 2G Aerial	1
			Location, driver's/passenger's/center - Left Side	
			Door, Material & Finish, Access - smooth aluminum	
			Latch, Door, Access - lift and turn latch	
211	0003492		Hose Bed Capacity, Special Amount, Ascendant, 100' AAT, PAP, PAL	1
			Capacity, Hosebed - 600' of 3.00 inch	
212	0591017		Hose Restraint, Hose Bed, Aerial, Front Velcro Strap, Top	1
213	0581819		Hose Restraint, Hose Bed, Vinyl, Top, Aerial	1
			Color, Vinyl Cover - a) red	
			Type of fastener - jacket snap - Sides of Hosebed	
			Type of fastener, Front - jacket snaps - Front Hosebed	
214	0670766		Running Boards, Flip Out, PUC, Aerial	1
215	0771483		Turntable Steps-Morton Cass, Swing Down, LS only, Ascend TA, PAL, PAP, Handhld Cut Out	1
216	0554001		Lights, Step (3), P25 LED, Swing Down Access Steps, One Side	1
217	0690023		Wall, Rear, Smooth Aluminum	1
218	0029508		Tow Eyes, Chrome (2) (Aerial)	1
219	0013641		Construction, Compt, Alum, Ascendant Tandem, PAL, 85 PAP	1
220	0063696		Compt, LS F/H F/D, Roll Drs, w/Chute, Ascendant Tandem, 105 HDL, 100 HAL	1
221	0798721	SP	Compt, LS Turntable, F/H, Roll Drs, Special Door Height, Ascend TA, 105'	1
222	0023672		Compt, IPO Stairs, Not Required, LS	1
223	0063735		Compt, RS F/H F/D, Roll Drs, w/o Chute, Ascendant Tandem, 105', 100 HAL	1
224	0063739		Compt, RS Turntable, F/H F/D, Roll Drs, Ascendant Tandem, 105 HDL	1
225	0023670		Compt, IPO Stairs RS, Lap Door	1
226	0594012		Doors, Amdor, Rollup, Side Compartments	9
			Qty, Door Accessory - 09	
			Color, Roll-up Door - AMDOR Satin Aluminum	
			Latch, Roll-up Door - Non-Locking Liftbar	
227	0552955		Blister, Compts in Front of Rear Axle, To Clear Firemaax Suspension	1
228	0609440	SP	Bumper, Rear, 5" w/Treadplate Cover on Top, Sides, Rear, PAP/PAL/RMAP	1
229	0788393	SP	Door Stop, Reduced in Height, Amdor Rollup Door	1
			Location, Door Accessory - D2 and P2	
230	0551416		Lights, Compt, On Scene Solutions, LED & Truck-Lite Model 79384	12
			Location - all body compartments	
			Qty, - 12	

Line	Option	Type	Option Description	Qty
231	0603420		Shelf Tracks, Painted, Aerial Qty, Shelf Track - 06 Location, Shelf Track - LS1, LS3, LS4, RS1, RS3 and RS4	6
232	0600289		Shelves, Adj, 500 lb Capacity, Full Width/Depth, Predefined Locations, Aerial Qty, Shelf - 06 Material Finish, Shelf - Painted - Spatter Gray Location, Shelves/Trays, Predefined - RS5-Upper Third, RS4-Upper Third, RS1-Upper Third, LS4-Upper Third and LS1-Upper Third	6
233	0542387		Compt, IPO Chute, Rear Access, Tandem Axle, Smooth Alum Door Location - right side Qty, - 1	1
234	0612228	SP	Box, Storage, On Top of Body Compt, Hatch Style, 116"L, Alum, LED Strip Light Location - top of body driver and passenger side Qty, - 02 Width - 24.00" Depth - 18.50"	2
235	0004016		Rub Rail, Aluminum Extruded, Side of Body	1
236	0004027		Fender Crowns, Rear, S/S, Two Pair	1
237	0519849		Not Required, Hose, Hard Suction	1
238	0022041		No Handrails Req'd @ Side Pump Panel, No Pump Module	1
239	0601235		Compt, Air Bottle, Single, Round, Fender Panel, Tandem Axle Aerials Qty, Air Bottle Comp - 7 Door Finish, Fender Compt - Polished Location, Fender Compt - Single (2) - LS Tandem, Single (2) - RS Tandem, Single - LS Rear, Single - RS Fwd and Single - RS Rear Latch, Air Bottle Compt - Flush Lift & Turn Insert, Air Bottle Compt - Rubber Matting	7
239	0000000	STF	Ladder, 35' Duo-Safety 1200A 2-Sect, Provide by FRFA Qty, - 1	1
239	0000000	STF	Ladder, 45', Duo-Safety 1525A 3-Sec w/Poles - Provided By FRFA	1
239	0000000	STF	Ladder, 28' Duo-Safety 1200A 2-Sec, Provided by FRFA Qty, - 1	1
239	0000000	STF	Ladder, 16' Duo-Safety 875A Roof, Provided By FRFA Qty, - 02	2
239	0000000	STF	Ladder, 14' Duo-Safety 775-DR Roof with 7/8" Hooks, Both Ends, 16.00" Wide Qty, - 02	2
240	0521218		Not Required, Attic Extension Ladder	1
240	0000000	STF	Ladder, 10' Duo-Safety Folding 585A - Provided By FRFA Qty, - 1	1
241	0592248		Ladders Stored in Torque Box, Amdor Roll, Ascendant TA, PAL, PAP Color, Roll-up Door - AMDOR Satin Aluminum	1
242	0666730	SP	Light, Torque Box Ladder Storage, (1) Truck-Lite 44308C LED IPOS	1
243	0602102		Lights, Torque Box Ladder Storage, Truck-Lite 44042C 2lts, LED, Round 4"	1
244	0685402		Dura-Surf, Added Location - on the bottom of all the ladder troughs Qty, - 01	1
245	0658170		Ladders, Nested, Right Side Ground Ladder Storage	1
246	0775907		Pike Pole, 12' DUO Safety, Fiberglass Qty, - 02	2
247	0789564		Pike Pole, 8' DUO Safety, Fiberglass, Aerial Qty, - 02	2
248	0789566		Pike Pole, 6' DUO Safety, Fiberglass, Aerial Qty, - 02	2
249	0695625	SP	Pike Pole, 3' Fire Hooks Unlimited, National Hook w/D Handle Qty, - 02	2
250	0770578		Pike Pole Tubes, in Torque Box/Ladder Storage, ABS Qty, - 06	6
251	0024388		No Steps Required, Front Of Body	1
252	0515695		Pump, Pierce, 1500 GPM, Single Stage, PUC	1
253	0515822		Seal, Mechanical, Silicon Carbide, PUC Pump	1
254	0515705		Gear Case, Pierce Pump, REPTO-Clutch Drive	1
255	0501370		Pumping Mode, Stationary Only, PUC	1
256	0515829		Pump Shift, Sure-Shift	1

Line	Option	Type	Option Description	Qty
257	0515833		Transmission Lock-up, Not Req'd, Park to Neutral, Pump, PUC	1
258	0515835		Auxiliary Cooling System, PUC	1
259	0014486		Not Required, Transfer Valve, Stage Pump	1
260	0746508		Valve(s), Relief Intake, Trident Air Max, Control Location	1
			Qty - 1	
			Pressure Setting - 125 psig	
			Intake Relief Valve Control - Left Side Pump Panel	
261	0515838		Controller, Pressure, Pierce, PUC	1
262	0072153		Primer, Trident, Air Prime, Air Operated	1
263	0780359		Manuals, Pump, (2) Total, Electronic Copies, Pierce PUC Pump	1
264	0602496		Plumbing, Stainless Steel and Hose, Single Stage Pump, PUC	1
265	0089437		Plumbing Without Foam System	1
266	0517852		Inlets, 6.00" - 1500 GPM, Pierce PUC Pump	1
267	0004646		Cap, Main Pump Inlet, Long Handle, NST, VLH	1
267	0000000	STF	Valve, Ball Intake Relief, Akron Revolution, Provided By FRFA	2
			Location - right and left side	
			Qty - 2	
			Connection, Inlet, Side B - 5.0" Storz with a cap	
			Connection, Outlet, Side A - 6.0" FNST swivel long handle	
			Ball Intake Valve - 7982 (30 degree swivel inlet)	
268	0084610		Valves, Akron 8000 series- All	1
269	0004660		Inlet, Left Side, 2.50"	1
270	0004680		Inlet, Right Side, 2.50"	1
271	0520002		Valve, Inlet(s) Recessed, Side Cntrl, PUC	1
			Qty, Inlets - 1	
272	0521137		Anode, Zinc, Pair, Pump Inlets, PUC	1
273	0004700		Control, Inlet, at Valve	1
274	0092569		No Rear Inlet (Large Dia) Requested	1
275	0092696		Not Required, Cap, Rear Inlet	1
276	0064116		No Rear Inlet Actuation Required	1
277	0009648		No Rear Intake Relief Valve Required on Rear Inlet	1
278	0092568		No Rear Auxiliary Inlet Requested	1
279	0563738		Valve, .75" Bleeder, Aux. Side Inlet, Swing Handle	1
280	0687424		Tank to Pump, (1) 3.00" Valve, 4.00" Plumbing, 3.00" Tank Outlet, Aerial PUC	1
281	0595508		Outlet, Tank Fill, 1.50", PUC	1
282	0516755		Outlet, Left Side, 2.50" (2), PUC	1
283	0092570		Not Required, Outlets, Left Side Additional	1
284	0766761		Outlet, Right Side, 2.50", (1), Electric Akron 9335 Controller, PUC	1
			Qty, Discharges - 01	
285	0766992		Outlet, Right Side, 4" w/4" Valve, Akron 9335 Elec Controller, PUC	1
286	0648906		Outlet, Front, 2.50" w/2.50" Plumbing	1
			Fitting, Outlet - 2.50" NST with 90 degree swivel	
			Drain, Front Outlet - Automatic	
			Location, Front, Single - top of right bumper	
287	0092575		Not Required, Outlet, Rear	1
288	0092574		Not Required, Outlet, Rear, Additional	1
289	0092573		Not Required, Outlet, Hose Bed/Running Board Tray	1
290	0752097		Caps/Plugs for 1.00" to 3.00" Discharges/Inlets, Chain	1
291	0563739		Valve, 0.75" Bleeder, Discharges, Swing Handle	1
292	0055095		Not Required, Elbow, Left Side Outlets, 2.50"	1
293	0035094		Not Required, Elbow, Left Side Outlets, Additional	1
294	0021134		Not Required, Elbow, Right Side Outlets	1
295	0045099		Not Required, Elbow, Rear Outlets	1
296	0085695		Not Required, Elbow, Rear Outlets, Large, Additional	1
297	0527969		Cap, Large Dia Outlet, 4.00", IPO Elbow	1
298	0018852		Reducer, 5" Storz x 2.50" MNST w/Cap	1
			Qty, Adapter for Outlets - 01	
			Location, Adapter(s) - larger diameter	
299	0766941		Control, Outlets, Swing Handle, Elec Right Outlets Akron 9335 w/Press Disp, PUC	1
300	0029106		Not Required, Deluge Outlet	1
301	0029302		No Monitor Requested	1
302	0029304		No Nozzle Req'd	1

Line	Option	Type	Option Description	Qty
303	0029107		No Deluge Mount	1
304	0527482		Waterway Outlet & Control, PUC	1
305	0641234	SP	Crosslays, Low Mt, (2) 1.50", F-W, Spl Cap, w/Poly Trays, 14" Off Frameraills,PUC	1
			Capacity, Special Xlay - 250' of 1.75" hose, each	
306	0780116		Crosslay, (1) 2.50" Std Cap, W/ Full Width Poly Tray, PUC	1
307	0029260		Not Required, Speedlays	1
308	0637040	SP	Hose Restraint, Crosslay/Deadlay, Nylon Web,(1) Seat Belt Buckles Each Side, PUC	3
			Qty, - 03	
			Nylon Web Color - Black	
309	0750536		Hose Restr, Spdly, Not Required, No Spdly	1
310	0639157		Enclosure, Crosslay Module w/ Boom Support Compt, Full Width, Gortite, PUC	1
			Color, Roll-up Door, Gortite - Painted to Match Lower Body	
			Latch, Roll-up Door, Gortite - Non-Locking Liftbar	
			Door Guard - Drip Pan Required	
311	0799498	SP	Speedlay, Enclosure, Special Information	1
312	0770913	SP	Mounting, (1) Stokes Basket, Dual Access, Upper Crosslay Area, PUC	1
			Size - 84.50"L x 23"W x 7.75"THK	
313	0044333		Not Required, Foam System	1
314	0012126		Not Required, CAF Compressor	1
315	0552517		Not Required, Refill, Foam Tank	1
316	0042573		Not Required, Foam System Demonstration	1
317	0045465		Not Required, Foam Tanks	1
318	0091110		Not Required, Foam Tank Drain	1
319	0091079		Not Required, Foam Tank #2	1
320	0091112		Not Required, Foam Tank #2 Drain	1
321	0553873		Pump Operators Panel & Module, Aluminum, Control Zone, Ascendant/PAL/PAP PUC	1
322	0032479		Pump Panel Configuration, Control Zone	1
323	0579538		Step, Slide-Out/Fold-Out, Pump Operator Platform, Aerial PUC, w/Enclosure	1
324	0769430		Light, Slide-Out Pump Operator Step, Amdor AY-LB-12HW020, Short Step	1
325	0516975		Material, Pump Panels, Operators Brushed Stainless, Sides Brushed Stainless, PUC	1
326	0516978		Pump and Plumbing Access, Simple Tilt Service, PUC	1
327	0520016		Not Required, Pumphouse Structure, PUC	1
328	0520326		Light, Pump Compt, PUC	1
329	0516983		Gauges, Engine, Included With Pierce Pressure Controller, PUC	1
330	0005601		Throttle Included w/ Pressure Controller	1
331	0549333		Indicators, Engine, Included with Pressure Controller	1
332	0511078		Gauges, 4.00" Master, Class 1, 30"-0-600psi	1
333	0511100		Gauge, 2.00" Pressure, Class 1, 30"-0-400psi	1
334	0687532	SP	Gauge, Water Level, Pierce, In pressure Controller, PUC	1
335	0006774		Not Required, Foam Level Gauge	1
336	0695170		Light, Pump Operator & Panel, Side Ctrl, PUC, Dual 6060C Cab & LED OH	1
337	0606694		Air Horns, (2) Hadley, 6" Round, In Bumper	1
338	0606834		Location, Air Horns, Bumper, Each Side, Outside Frame, Inboard (Pos #2 & #6)	1
339	0006064		Control, Air Horn, DS & PS Foot Sw	1
340	0006100		No Electronic Siren	1
341	0046133		No Siren Location	1
342	0076155		No Siren Switch	1
343	0006188		No Speaker	1
344	0550461		Location, Not Required, No Speaker (Q2B)	1
345	0016080		Siren, Federal Q2B	1
346	0006095		Siren, Mechanical, Mounted Above Deckplate	1
			Location, Siren, Mech - a) Left	
347	0026160		Control, Mech Siren, Horn Ring, PS Foot Sw	1
348	0642299		Grounding Strap, Q2B Siren Motor to Ground Stud	1
349	0606886	SP	Lightbar, Wln, Freedom IV-Q, 2-21.5", RRWRR RRWRR, 30, Deg	1
			Filter, Whl Freedom Ltbrs - No Filters	
350	0691599		Light, GTT, 792* Strobe Opticom Emitter, Remote Mounted on Cab Roof	1
			Location - driver side cab roof, just to the outside of the notch	
			Opticom Priority - b) High	

Line	Option	Type	Option Description	Qty
350			Opticom Activation - Cab Switch & E-Master Momentary Opticom Activation - no activation	
351	0016380		No Additional Lights Req'd, Side Zone Upper	1
352	0540451		Light, Front Zone, WIn M6* LED, Colored Lens, 4lts Q Bezel Color, Lt DS Frnt Outside - DS Front Outside Red Color, Lt PS Frnt Outside - PS Front Outside Red Color, Lt DS Front Inside - w) DS Front Inside White Color, Lt PS Front Inside - w) PS Front Inside White	1
353	0747228		Lights, Side Zone Lower, WIn M6**, M6**, M6**, 6Lts Location, Lights Front Side - b)each side bumper Color, Lens, LED's - Colored Location, Lights Mid Side - Over Front Wheels Location, Lights Rear Side - Between Tandem Color, Trim - Chrome Trim Color, Lt Side Front, DS - Red Color, Lt Side Front, PS - Red Color, Lt Side Mid DS - Blue Color, Lt Side Mid PS - Blue Color, Lt Side Rear PS - Red Color, Lt Side Rear DS - Red	1
354	0634517		Lights, Side, WIn M6* LED w/45 Degree Bezel, Cab Corner, pair Qty, Lights, Pair - 1 Control, Light - b) side warning Color, WIn Sup600 LED - a) rd/rd Material, Bracket - Polished S/S	1
355	0540777		Lights, Rear Zone Lower, WIn M6* LED, Colored Lens Color, Lt DS Rear - r) DS Rear Lt Red Color, Lt PS Rear - r) PS Rear Lt Red	1
356	0754220		Lights, Rear, WIn M6** LED, Features 1st Location - above taillights left side Qty, - 01 Color, Lights, Warning - Red Flashing Control, Light - a) rear upper warning Color, Lens, LED's - Colored Color, Trim - Chrome Trim	1
357	0753899		Lights, Rear, WIn M6** LED, Features 2nd Location - above taillights right side Qty, - 01 Color, Lights, Warning - Blue Flashing Control, Light - a) rear upper warning Color, Lens, LED's - Colored Color, Trim - Chrome Trim	1
358	0680854		Light, Rear Zone Upper, WIn B6M7**1P, Super LED Beacon w/M7 LED Lt Color, Lights, Warning - c) amber Color, Dome, Rear Warning - b)both domes red Control, Light - a) rear upper warning Color, Lens, LED's - m)match LED's	1
359	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
360	0791468		Light, Traffic Directing, WIn TAM85 46.87" Long LED Activation, Traffic Dir L - Not Connected	1
361	0530074		Location, Traf Dir Lt, On Top of Body Below Turntable w/Trdplt Box	1
362	0530280		Location, Traf Dir Lt Controller, Overhead Switch Panel DS Center	1
363	0006646		Electrical System, 120/240VAC, General Design	1
364	0682571	SP	Generator, Harrison 6kW, 6.0MAS-16R/D-11011/15/1, Hydraulic, Hotshift PTO, Spcl Generator Interlocks - Parking Brake/Neutral Location, Gen Info Panel - near breaker box	1
365	0517171		Location, Hydraulic Generator, Cargo Area, Front of Body, PRM/PUC Location, Generator - center	1
366	0016752		Starting Sw, Truck Engine Powered Gen, Cab Sw Pnl	1
367	0016757		Not Required, Remote Start, Generator	1
368	0016740		Not Required, Fuel System	1
369	0016767		Not Required, Oil Drain Extension, Generator	1
370	0016771		Not Required, Routing Exhaust, Generator	1

Line	Option	Type	Option Description	Qty
371	0036738		Circuit Breaker Panel, Included With PTO Generator	1
			Location, Circuit Breaker Panel - LS6, Back Wall to the Left	
372	0507757		Location, Gen Meter Panel, Spcl Location IPO Std, No Green Ind Lt	1
			Location - D4 body compartment on forward wall - near breaker panel	
373	0745228		Pump, Thru-Pump, For Hydraulic Driven Devices	1
374	0599108		Bracket, Alum. Trdplate, For 120/240volt Recessed Flood Lights, Compt Top, Each	2
			Location - each side of rear body	
			Qty, - 02	
375	0663549		Light, Wln, 150W 120V, PCP2AC LED Fld/Spt, PBA203 Recessed 15 Deg 2nd	1
			Location, 120/240 Volt Lt - passenger side body just forward of turn table	
			Qty, 120/240 Volt Light - 1	
			Switch, Lt Control 1 - n) No Control	
			Switch, Lt Control 2 - n) No Control	
			Switch, Lt Control 3 - n) No Control	
			Switch, Lt Control 4 - n) No Control	
			Color, Wln Lt Housing - White Paint	
376	0664852		Light, Wln, 150W 120V, PCP2AC LED Fld/Spt, PBA203 Recessed 15 Deg 1st	1
			Location, 120/240 Volt Lt - driver side body just forward of turn table	
			Qty, 120/240 Volt Light - 1	
			Switch, Lt Control 1 - n) No Control	
			Switch, Lt Control 2 - n) No Control	
			Switch, Lt Control 3 - n) No Control	
			Switch, Lt Control 4 - n) No Control	
			Color, Wln Lt Housing - White Paint	
377	0006825		Reel, Elect Cable, Hannay, 1600, (3) Wire	1
			Qty, Cord Reels - 1	
			Reel Guide - a) Nylatron guide	
			Finish, Reel - Painted Gray	
			Location, Electric Cord Reel - PS Hatch Compartment, Forward, 1 Reel	
378	0006828		Cord, Electric, 10/3 Yellow, 3 Wire	1
			Lengths of Elect Cord - 1	
			Feet of Yellow Cord - e)200	
			Connection, Cord - Direct connection	
379	0788932		Box, Junc, Akron, 3Wire, 4-15/20A 120V Dup SB	1
			Qty, - 01	
			Connection, Electric Plug / Inlet (Male) - Direct Connection	
380	0640306	SP	Reel, Feed Through Floor of Hatch Compartment, Nylatron Guide	1
			Location - above P6	
			Qty, - 1	
381	0780350		Receptacle Strip, 15A 120V 6-Place, Interior Cab	1
			Qty, - 1	
			Location 1 - along the back of the engine dog house tied up loose (see photo)	
			AC Power Source - Shoreline	
382	0779698		Receptacle Strip, 15A 120V 6-Place, Interior Body	1
			Qty, - 01	
			Location 1 - the receptacle is to be located on the back/tank wall of compartment P6 - see photo	
			AC Power Source - Shoreline	
383	0783678		Receptacle, 15/20A 120V 3-Pr 3-Wr, NEMA 5-20R SB Dup, 1st	5
			Location, Receptacles - one on each side of the extended crew cab, just above the compartment, one each side at the forward portion of each body fender, and one at the rear of the body on passenger side	
			Qty, - 05	
			AC Power Source - Generator	
			Cover, Receptacle - Exterior Flip Up Duplex Cover(s)	
384	0519934		Not Required, Brand, Hydraulic Tool System	1
385	0649753		Not Required, PTO Driven Hydraulic Tool System	1
386	0755095		Aerial, 107' ASL Tandem, 750/500 Tip, 50 MPH	1
387	0000042		Boom Support, Rear of the Chassis Cab	1
388	0762413		Light, Boom Support, Amdor AY-LB-12HW012, 12" LED	1
389	0799584		Body Structure, No Boom Support Compartment, Rear of Cab, PUC	1
390	0680821		Boom Panel, Pair	1
			Paint Color, Predefined - #20 White	

Line	Option	Type	Option Description	Qty
391	0526885		Indicator, Extension, Inside and Outside Handrails, Every 10'	1
			Color - 1) black	
392	0591645		Steps, Folding, Four, Aerial Device, Trident	1
			Coating, Step - luminescent	
393	0688232		Rung Covers, Aerial Device	1
			Rung Cover Color - Safety Yellow	
394	0678539		Brackets Only, Roof Ladder, Aerial Fly Section	1
			Finish - Painted, Aerial Device Color	
			Roof Ladder, Make/Model - 14' Duo-Safety 775-A Special Width	
395	0680785		Limited Retraction, Aerial	1
396	0601972		Lights, Turntable Walkway, P25, LED	1
397	0601949		Light, Turntable Console, TecNiq T-10, LED Strip Light	1
398	0657520		Guard, Turntable Lighting	1
399	0793038		Control Stations, ASL Tandem Axle, MUX, Color Display	1
400	0792976		Stabilizers, Ascendant Tandem, Rear Mount Steel, 16' Spread, 18" Pen, MUX	1
			Material, Stabilizer Pad - Composite	
401	0548900		Door, Stabilizer Control Box, Aerial MUX, Hinged Outboard, Smooth Aluminum	1
402	0793039		Hydraulic System, Ascendant Tandem Axle	1
403	0793037		Swivels, D-Series w/Encoder, ASL-Tandem/Tiller, MUX (28 Collector Rings)	1
404	0793396		Electrical System, ASL Tandem Axle, MUX	1
405	0709376		Lights, Wln MPB* Micro LED, Trk & Tip, 4lts (PAL/HAL)	1
			Location, Sw, Arl DC Lts - m) 2 locations	
			Color, Wln Lt Housing - White Paint	
406	0540746		Lights, Stabilizer Warn (2) Sets, Wln M6* LED, Colored Lens	1
			Color, Lt Rr Stabilzr Pan - r) Pan Light Red	
			Color, Lt Fr Stabilzr Pan - r) Pan Light Red	
407	0068703		Lights, Grote Supernova LED, Stabilizer Beam, (1) Set	1
408	0762388		Lights, Stabilizer Scene, (2) sets, Amdor AY-LB-12HW012, LED	1
409	0091927		AC Power To Aerial Tip, 20 Amp Household (PAL)	1
410	0006920		Intercom, 2-Way Atkinson (PAL)	1
411	0754291	SP	Breathing Air to Tip, (1) 6000 PSI, Ascendant Tandem, Job 32624/Denver	1
			Refill Hose - 50'	
			Breathing Air Fitting - CEJN	
			Breathing Air Mask Box - mask box ladder	
412	0024742		Not Required, Mask, Breathing Air To Tip	1
413	0056918		Not Required, Raised Aerial Pedestal	1
414	0604457		Lifting Eye Assembly, Rope Rescue Attachment, ASL	1
415	0530826		Turntable Access, ManSaver Bars, Yellow	1
416	0624672		Waterway, High Flow, 1500 GPM, ASL	1
417	0632855		Monitor, Akron 3480 StreamMaster II Electric w/Extended Vertical Travel	1
			Nozzle, Monitor 1 PAL - Akron 1578 Electric 1250 gpm	
418	0010758		Flow Meter, Waterway, PAL, 110' Ascendant, MUX	1
419	0017508		Inlet, 6.00" NST w/5.00" Piping at Rear, Ascendant Tandem, PAP, PAL	1
420	0673128		Quick-Lock Waterway Locking System, 100' HDL, 105' HDL, ASL	1
421	0047897		Tools, Aerial	1
422	0559494		Manuals and Training, 3 Consecutive Days, Ascendant Ladder, PAL	1
423	0639193		Cap, 2.5" FNST, Chrome Rocker Lug w/Chain	1
			Qty, - 1	
424	0007150		Bag of Nuts and Bolts	1
			Qty, Bag Nuts and Bolts - 1	
425	0602507		NFPA Required Loose Equipment, Aerial, NFPA 2016, Provided by Fire Department	1
426	0659287		Soft Suction Hose, Provided by Fire Department, Aerial NFPA Classification	1
427	0027023		No Strainer Required	1
428	0602535		Extinguisher, Dry Chemical, Aerial NFPA 2016, Provided by Fire Department	1
429	0602354		Extinguisher, 2.5 Gal. Pressurized Water, Aerial, NFPA 2016, Provided by Fire Dept	1
430	0007482		Not Required, Crowbars	1
431	0007484		Not Required, Claw Tools	1
432	0602675		Axes, (2) Flathead, Aerial NFPA 2016, Provided by Fire Department	1
433	0602673		Axes, (3) Pickhead, Provided by Fire Department, Aerial NFPA 2016	1
434	0007494		Not Required, Sledgehammers	1

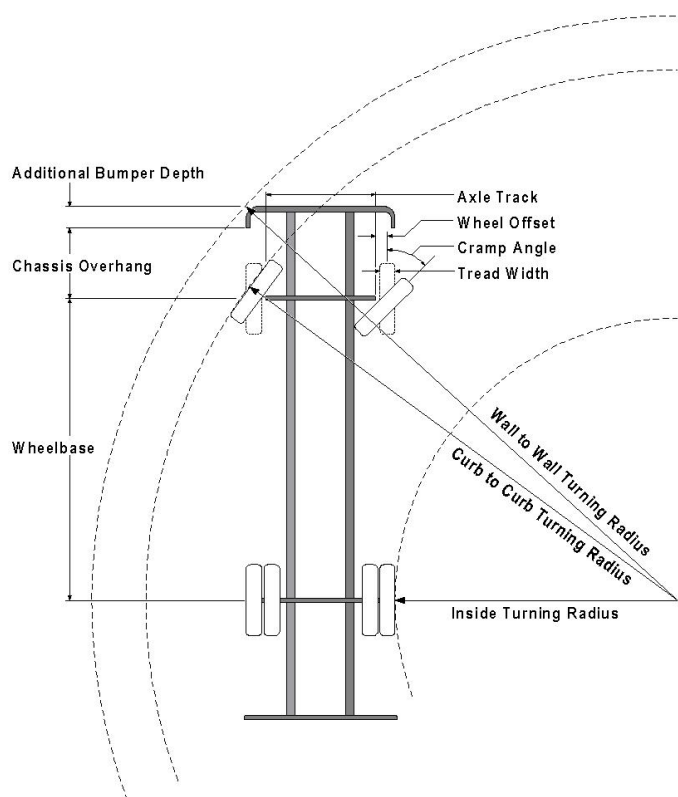
Line	Option	Type	Option Description	Qty
435	0559573		Paint, Single Color, Custom	1
			Paint Color, Predefined - #20 White	
436	0636524		Coating, Chassis Frame Assy, With Liner, Hot Dip Galvanized	1
			Paint Color, Frame Assembly, Predefined - Gloss Black	
437	0693797		No Paint Required, Aluminum Front Wheels	1
438	0693792		No Paint Required, Aluminum Rear Wheels	1
439	0007230		Compartment, Painted, Spatter Gray	1
440	0782202		Aerial Ladder Paint, ASL-Tandem	1
			Paint Color, Aerial Device - Blue White 20	
			Paint Color, Egress - #50 Red	
			Paint Color, Turntable - Blue White 20	
			Paint Color, Boom Support - gloss black primer	
			Paint Color, Cylinders - blue white 20	
			Paint Color, Aerial Torque Box - gloss black primer	
			Paint Color, Aerial Stabilizers - black 101	
			Paint Color, Aerial Control Console - blue white 20	
441	0544129		Reflective Band, 1"-6"-1"	1
			Color, Reflect Band - A - e) black	
			Color, Reflect Band - B - t) gold	
			Color, Reflect Band - C - za) black	
442	0510041		Reflective across Cab Face, Imp/Vel	1
443	0583454		Stripe, Chevron, Rear, Diamond Grade, Aerial	1
			Color, Rear Chevron DG - fluorescent yellow green	
444	0598754		Stripe, Reflective/Diamond Grade, 4.00" on Stabilizers	1
			Color, Reflect Band - A - g) yellow	
445	0027341		Jog, In Reflective Stripe, Single or Multiple	1
			Qty, - 1	
446	0515348		Stripe, Black Outline, Scotchlite on Reflective Band	1
			Qty, - 1	
447	0509398		Stripe, Reflective, Chevron, Cab and Crew Cab Doors Interior	1
			Color, Reflect Band - B - t) gold	
			Size, Chevron Striping - 04	
			Color, Reflect Chev - A - e) black	
448	0033179		Lettering Specifications, Reflective	1
449	0686159		Lettering, Reflective, 3.00", (41-60)	1
			Outline, Lettering - Outline	
450	0685991		Lettering, Reflective, 10.00", (21-40)	1
			Outline, Lettering - Outline	
451	0515269		Lettering, Reflective 2" Script w/outline	1
			Color, Lettering - e) black	
452	0041534		Emblem, (3) Letter Monogram Style with Lettering, Reflective, Denver, Each	2
			Qty, - 02	
			Location, Emblem - on each side on cab door	
			Color, Reflective - i) gold	
453	0522815		Emblem, American Flag, Waving, Gerber Vision, Pair	1
			Location, Emblem - in the window over the rear cab door	
454	0666414		Emblem, Freedom Flag, Each	1
			Qty, - 01	
			Location, Emblem - R1	
			Size, Flag - 24" - 25"	
454	0000000	STF	Akron Trimeese (3) 2.5" (F) NST x 6" (F) NST - Denver NEW!!!	2
			Qty, - 02	
455	0031972		Manuals, Two (2), Fire Apparatus Parts, Custom Chassis	1
456	0002905		Manuals, (2) Chassis Service, Custom	1
457	0032433		Manuals, Two (2) Chassis Operation, Custom	1
458	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
459	0611136		Warranty, Chassis, 3 Year, Velocity/Impel, WA0284	1
460	0696698		Warranty, Engine, Cummins, 5 Year, WA0181	1
461	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
462	0595767		Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	1
463	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
464	0777368		Warranty, Axle, 2 Year, Meritor, General Service, WA0328	1
465	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1

Line	Option	Type	Option Description	Qty
466	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
467	0595813		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
468	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
469	0695416		Warranty, Pierce Camera System, WA0188	1
470	0708760		Warranty, Not Applicable, LED Strip Lights	1
471	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
472	0685945		Warranty, Transmission Cooler, WA0216	1
473	0688798		Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	1
474	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
475	0681118		Warranty, ROM, Roll-up Door, 7 Year, WA0206	1
476	0516693		Warranty, Pump, Pierce, PUC, 6 Year Parts, 1 Year Labor, WA0039	1
477	0648675		Warranty, 10 Year S/S Pumping, WA0035	1
478	0641372		Warranty, Foam System, Not Available	1
479	0006999		Warranty, Structure, 20 Year, Aerial Device, WA0052	1
480	0687388		Warranty, Swivels, 5 Year, Aerial Device, WA0197	1
481	0088889		Not Required, Additional Aerial Warranty	1
482	0687327		Warranty, Waterway, 10 Year, Aerial Device, WA0198	1
483	0595860		Warranty, Paint, 4 Year, Aerial Device, Pro-Rated, WA0047	1
484	0609981		Warranty, Harrison Generator, 6 Year, WA0285	1
485	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
486	0595412		Warranty, Graphics Lamination, 1 Year, Apparatus, WA0168	1
487	0683627		Certification, Vehicle Stability, CD0156	1
488	0610734		Certification, Engine Installation, Velocity, Cummins X12, 2016, CD0111	1
489	0686786		Certification, Power Steering, CD0098	1
490	0667417		Certification, Cab Integrity, Velocity FR, CD0009	1
491	0548950		Certification, Cab Door Durability, Velocity/Impel, CD0001	1
492	0548967		Certification, Windshield Wiper Durability, Impel/Velocity, CD0005	1
493	0667411		Certification, Electric Window Durability, Velocity/Impel FR, CD0004	1
494	0549273		Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	1
495	0667416		Certification, Cab Heater and Defroster, Velocity/Impel FR, CD0015	1
496	0667415		Certification, Cab Air Conditioning Performance, Velocity/Impel FR, CD0016	1
497	0545073		Amp Draw Report, NFPA Current Edition	1
498	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
499	0799248		Appleton/Florida BTO	1
500	0000049		Ascendant BODY	1
501	0000012		PIERCE CHASSIS	1
502	0004713		ENGINE, OTHER	1
503	0046396		EVS 4000 Series TRANSMISSION	1
504	0520324		PIERCE PUMP, PUC	1
505	0020009		POLY TANK	1
506	0028047		NO FOAM SYSTEM	1
507	0020006		SIDE CONTROL	1
508	0020007		AKRON VALVES	1
509	0020015		ABS SYSTEM	1
510	0658751		PUMPER BASE	1



Turning Performance Analysis

12/11/2019

Bid Number: 964**Chassis:** Velocity Chassis, Aerials, Tandem Axle, Ascendant PUC (Big Block), 2010**Department:** Denver Fire Department**Body:** Aerial, HD Ladder 107' ASL Tandem, PUC, Alum Body**Parameters:**

*Inside Cramp Angle:	45°
Axle Track:	82.92 in.
Wheel Offset:	4.68 in.
Tread Width:	16.3 in.
Chassis Overhang:	78 in.
Additional Bumper Depth:	16 in.
Front Overhang:	94 in.
Wheelbase:	250.5 in.

Calculated Turning Radii:

Inside Turn:	19 ft. 10 in.
Curb to curb:	35 ft. 10 in.
Wall to wall:	40 ft. 8 in.

Category	Option	Description
Axle, Front, Custom	0508849	Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel
Wheels, Front	0019611	Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot
Tires, Front	0594821	Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply
Bumpers	0123624	Bumper, 16" Extended, Imp/Vel
Aerial Devices	0755095	Aerial, 107' ASL Tandem, 750/500 Tip, 50 MPH

Notes:

*Actual Inside cramp angle may be less than shown.

Curb to Curb turning radius calculated for 9.00 inch curb.

Definitions:

Inside CrampAngle	Maximum turning angle of the front inside fire.
Axle Track	King-pin to King-pin distance of front axle.
Wheel Offset	Offset from the center line of the wheel to the King-pin.
Tread Width	Width of the tire tread.
Chassis Overhang	Distance of the center line of the front axle to the front edge of the cab. This does not include the bumper depth.
Additional Bumper Wheel	Depth that the bumper assembly adds to the front overhang.
Wheelbase	Distance between the center lines of the vehicles front and rear axles.
Inside Turning Radius	Radius of the smallest circle around which the vehicle can turn.
Curb to Curb Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures assumes a curb height of 9 inches.
Wall to Wall Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures takes into account any front overhang due to chassis , bumper extensions and or aerial devices.



Electrical Analysis

12/11/2019

Bid #: 964**Job #:****Desc:** Aerial 107' Ascendant, Velocity**Sales Rep:** Doucette, Duane**Customer:** Denver Fire Department**Organization:** Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0000000	Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v,		0.00	0.50	0.00
0001244	High Idle w/Electronic Engine, Custom		0.00	1.20	0.00
0002526	Light, Engine Compt, All Custom Chassis		0.00	1.60	0.00
0002617	PTO switch, w/light - aerial		0.00	0.00	0.08
0006064	Control, Air Horn, DS & PS Foot Sw		0.00	0.83	0.00
0006825	Reel, Elect Cable, Hannay, 1600, (3) Wire		0.00	36.00	0.00
0006920	Intercom, 2-Way Atkinson (PAL)		0.00	3.00	0.00
0010758	Flow Meter, Waterway, PAL, 110' Ascendant, MUX		0.00	0.00	0.50
0016080	Siren, Federal Q2B		0.00	100.00	0.00
0072153	Primer, Trident, Air Prime, Air Operated		0.00	0.01	0.00
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel		0.00	180.00	0.00
0520326	Light, Pump Compt, PUC		0.00	1.80	0.00
0543751	Light, Do Not Move Apparatus		0.00	0.80	0.00
0548009	Wiring, Spare, 20 A 12V DC 1st		0.00	0.00	20.00
0549333	Indicators, Engine, Included with Pressure Controller		0.00	0.35	0.00
0551758	Lights, Backup, WIn M6BUW, LED, Flange Feature		0.00	3.20	0.00
0552777	Fuel Pump for Repriming		0.00	6.00	0.00
0559130	Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven		0.00	0.00	5.60
0589905	Alarm, Back-up Warning, PRECO 1040		0.00	0.50	0.00
0593759	ESC/ABS/ATC Wabco Brake System, Tandem Rear Axle, 2010		0.00	6.00	0.00
0604825	Batteries, (5) Exide Grp 31, 750 CCA each, Threaded Stud		0.00	3.00	0.00
0612106	Light, Visor, WIn, 12V PSL2* Pioneer LED Spottlt, Deep Notch Cab 1st		0.00	0.00	6.00
0631779	Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk		0.00	0.74	0.00
0634517	Lights, Side, WIn M6* LED w/45 Degree Bezel, Cab Corner, pair		0.00	2.70	1.80
0645687	Lights, Rear Scene, WIn, M6ZC LED, 1st		0.00	0.00	4.00
0650352	Spotlight, Golight Stryker, Model 30**4, LED, 2 Lts		0.00	0.00	3.00
0653526	Camera, Pierce, Driver Mux, Rear Camera Only		0.00	1.20	0.00
0657520	Guard, Turntable Lighting		0.00	0.00	2.10
0667902	Controls, Electric Windows, All Cab Doors, Impel/Veloccity FR		0.00	26.00	0.00
0667936	Heater/defroster, Dual Zone Control, Impel/Veloccity FR		0.00	0.00	12.10
0678027	Engine Brake, Jacobs Compression Brake, Cummins Engine, with		0.00	0.42	0.00
0750608	Air Conditioning, Dual Zone Control, Sp Condenser, Impel/Veloccity FR		0.00	0.00	96.50
0753899	Lights, Rear, WIn M6** LED, Features 2nd		0.00	1.35	0.90
0754220	Lights, Rear, WIn M6** LED, Features 1st		0.00	1.35	0.90
0774948	Lights, WIn, P*H1* Pioneer, 12 VDC, 2nd		0.00	0.00	6.50
0775524	Lights, WIn, P*H1* Pioneer, 12 VDC, 1st		0.00	0.00	6.50
0793038	Control Stations, ASL Tandem Axle, MUX, Color Display		0.00	0.00	4.26
0548004	Wiring, Spare, 15 A 12V DC 1st	LM	0.00	0.00	60.00
0548006	Wiring, Spare, 15 A 12V DC 2nd	LM	0.00	0.00	15.00
0002565	Hourmeter, Aerial Inside Cab	NFPA	0.10	0.00	0.00
0002615	Switch, Aerial 12V Master	NFPA	0.08	0.00	0.00
0002758	Amp Draw, NFPA/ULC Radio Allowance	NFPA	5.00	0.00	0.00
0023670	Compt, IPO Stairs RS, Lap Door	NFPA	0.90	0.00	0.90
0063696	Compt, LS F/H F/D, Roll Drs, w/Chute, Ascendant Tandem, 105 HDL,	NFPA	2.70	0.00	2.70
0063735	Compt, RS F/H F/D, Roll Drs, w/o Chute, Ascendant Tandem, 105',	NFPA	2.70	0.00	2.70
0063739	Compt, RS Turntable, F/H F/D, Roll Drs, Ascendant Tandem, 105 HDL	NFPA	1.80	0.00	1.80
0068703	Lights, Grote Supernova LED, Stabilizer Beam, (1) Set	NFPA	1.60	0.00	0.00
0090155	Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	NFPA	0.50	0.00	0.00
0092582	Load Manager/Sequencer, MUX	NFPA	0.56	0.56	0.00
0509649	Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per	NFPA	1.00	0.00	0.00

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

12/11/2019

Bid #: 964

Job #:
Desc: Aerial 107' Ascendant, Velocity

Sales Rep: Doucette, Duane

Customer: Denver Fire Department

Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0515838	Controller, Pressure, Pierce, PUC	NFPA	1.70	0.00	0.00
0516983	Gauges, Engine, Included With Pierce Pressure Controller, PUC	NFPA	0.30	0.00	0.00
0540451	Light, Front Zone, WIn M6* LED, Colored Lens, 4lts Q Bezel	NFPA	1.80	5.40	1.80
0540746	Lights, Stabilizer Warn (2) Sets, WIn M6* LED, Colored Lens	NFPA	3.60	5.40	0.00
0540777	Lights, Rear Zone Lower, WIn M6* LED, Colored Lens	NFPA	1.80	2.70	0.00
0542387	Compt, IPO Chute, Rear Access, Tandem Axle, Smooth Alum Door	NFPA	0.90	0.00	0.90
0551870	Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir	NFPA	0.83	2.49	0.00
0554001	Lights, Step (3), P25 LED, Swing Down Access Steps, One Side	NFPA	0.15	0.00	0.00
0555915	Wiper Control, 2-Speed with Intermittent, MUX, Impel/Veloccity	NFPA	2.10	8.40	0.00
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Veloccity 2010,	NFPA	1.26	0.00	0.00
0587033	Air Dryer, Brake, AD-9 w/heat, 2010	NFPA	4.70	0.00	0.00
0589378	Lights, Step, P25 LED, Aerial With Pump, Ign, Park Brake Set	NFPA	1.50	0.00	0.00
0595087	DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	NFPA	0.60	11.40	0.00
0601949	Light, Turntable Console, TecNiq T-10, LED Strip Light	NFPA	0.20	0.00	0.00
0601972	Lights, Turntable Walkway, P25, LED	NFPA	0.35	0.00	0.00
0602102	Lights, Torque Box Ladder Storage, Truck-Lite 44042C 2lts, LED,	NFPA	1.00	0.00	0.00
0606886	Lightbar, WIn, Freedom IV-Q, 2-21.5", RRWRR RRWRR, 30, Deg	NFPA	6.48	2.48	7.28
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	NFPA	1.20	0.00	0.00
0615864	Lights, Perimeter Body, Truck-Lite 44308C LED 1lt, Turntable Access	NFPA	0.50	0.00	0.00
0617874	Lights, Perimeter Pump House, Truck-Lite 44310C LED 2lts	NFPA	1.00	0.00	0.00
0631374	Lights, Deck, WIn (2) MPPBCS Micro Pioneer LED Rear Flood Lights	NFPA	6.70	0.00	0.00
0642591	Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Dash CF	NFPA	2.00	2.00	0.00
0647638	Lights, Dome, Weldon Dual LED 4 Lts	NFPA	0.80	0.80	0.00
0648074	Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	NFPA	0.49	0.00	0.00
0648425	Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF	NFPA	0.70	0.70	0.00
0648716	Headlights, Rectangular Halogen, Imp/Vel	NFPA	5.46	7.82	0.00
0664466	Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp	NFPA	0.69	0.00	0.00
0680854	Light, Rear Zone Upper, WIn B6M7**1P, Super LED Beacon w/M7	NFPA	6.00	0.00	0.00
0682571	Generator, Harrison 6kW, 6.0MAS-16R/D-11011/15/1, Hydraulic,	NFPA	35.31	0.00	0.00
0687532	Gauge, Water Level, Pierce, In pressure Controller, PUC	NFPA	1.23	0.00	0.00
0695170	Light, Pump Operator & Panel, Side Ctrl, PUC, Dual 6060C Cab &	NFPA	7.84	0.00	0.00
0695735	Lights, Perimeter Cab, Truck-Lite 44310C LED	NFPA	1.08	0.00	0.00
0709376	Lights, WIn MPB* Micro LED, Trk & Tip, 4lts (PAL/HAL)	NFPA	14.00	0.00	0.00
0709438	Light, Walking Surf, FRP Flood, LED	NFPA	2.00	0.00	0.00
0747228	Lights, Side Zone Lower, WIn M6**, M6**, M6**, 6Lts	NFPA	5.40	8.10	0.00
0755095	Aerial, 107' ASL Tandem, 750/500 Tip, 50 MPH	NFPA	5.00	0.00	0.00
0760797	Engine, Cummins ISX12, 500 hp, W/OBD, EPA 2016, REPTO, Vel,	NFPA	6.00	0.00	0.00
0762388	Lights, Stabilizer Scene, (2) sets, Amdor AY-LB-12HW012, LED	NFPA	0.72	0.00	0.00
0762413	Light, Boom Support, Amdor AY-LB-12HW012, 12" LED	NFPA	0.18	0.00	0.00
0769430	Light, Slide-Out Pump Operator Step, Amdor AY-LB-12HW020, Short	NFPA	0.30	0.00	0.00
0777637	Cab, Velocity FR, 7010 Raised Roof w/Deep Notch, PUC	NFPA	6.80	10.20	0.00
0781760	Light, Dir/Mark, Intrm, Truck-Lite 30375Y LED Grm Mt 4lts, Over 30'	NFPA	0.20	0.00	0.00
0791468	Light, Traffic Directing, WIn TAM85 46.87" Long LED	NFPA	2.52	2.52	0.00
0798721	Compt, LS Turntable, F/H, Roll Drs, Special Door Height, Ascend TA,	NFPA	2.70	0.00	2.70
0566294	Alternator, 430 amp, Niehoff C680-1	S	0.00	0.00	0.00
Load Totals:			163.03	449.52	266.52

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

12/11/2019

Bid #: 964**Job #:****Desc:** Aerial 107' Ascendant, Velocity**Sales Rep:** Doucette, Duane**Customer:** Denver Fire Department**Organization:** Front Range Fire Apparatus, Ltd

Note: Minimum Continuous Load is in "Blocking Right of Way" mode. (Reference current edition of NFPA 1901)

Note: Intermittent Load items are not factored in on any alternator load comparisons. These items are included on the report for reference only and should be looked at as amp draw exclusion items. (Reference current edition of NFPA 1901)

Note: Total Connected Load "Demand" represents Total Connected Load minus any Load Managed items

Alternator Output at Idle: 253.00

Minimum Continuous Load	
Supply:	253.00
Demand:	163.03
Variance:	89.97

Alternator Output at Governed Speed: 365.00

Total Connected Load	
Supply:	365.00
Demand:	354.55
Variance:	10.45

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



**DENVER FIRE DEPARTMENT
PIERCE 107’ HEAVY DUTY AERIAL LADDER**



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DENVER FIRE DEPARTMENT PIERCE 107' HEAVY DUTY AERIAL LADDER



Front Range Fire Apparatus is pleased to submit to Denver Fire Department for a **Pierce® 107' Heavy Duty Aerial Ladder** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment. This document will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

PIERCE MANUFACTURING was founded in 1913. Since then we have been building bodies with one philosophy, "BUILD THE FINEST". Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 75 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 62,500 apparatus, including more than 33,900 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 870,000 total square feet of floor space situated on approximately 105 acres of land. Our Bradenton, Florida facility has 300,000 square feet of floor space situated on approximately 38 acres of land.

Our beliefs in high ethical standards are carried through in all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current edition of NFPA 1901 standards, this document will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this document are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.



DENVER FIRE DEPARTMENT PIERCE 107' HEAVY DUTY AERIAL LADDER



QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society B2.1-2000 requirements for structural welding of sheet metal. Our flux core arc welding uses alloy rods, type 7000 and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs and American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that are established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance is included with this document.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to insure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least twenty five (25) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for



DENVER FIRE DEPARTMENT PIERCE 107' HEAVY DUTY AERIAL LADDER



personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Front Range Fire Apparatus by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within twenty five (25) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of \$5,000,000 in parts dedicated to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations. You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus. Published component catalogs, which include proprietary systems along with an extensive operators manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVTs, and offers hands-on repair and maintenance training classes multiple times a year.



DENVER FIRE DEPARTMENT PIERCE 107' HEAVY DUTY AERIAL LADDER



LIABILITY

The successful bidder will defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

INSURANCE PROVIDED BY BIDDER

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence \$1,000,000

Products/Completed Operations Aggregate \$1,000,000

Personal and Advertising Injury \$1,000,000

General Aggregate \$2,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form and will include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy will include Owner as an additional insured when required by written contract.

COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

The successful bidder will, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile liability insurance and coverage will be written on a Commercial Automobile liability form:

Each Accident Combined Single Limit: \$1,000,000

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate: \$3,000,000

Each Occurrence: \$3,000,000

The umbrella policy will be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile Liability policies.



DENVER FIRE DEPARTMENT PIERCE 107' HEAVY DUTY AERIAL LADDER



The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of Product Liability insurance:

Each Occurrence \$1,000,000

Products/Completed Operations Aggregate \$1,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form. The manufacturer's policy will include the owner as additional insured when required by written contract between the Owner and a Pierce authorized dealer.

UMBRELLA/EXCESS LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Each Occurrence: \$25,000,000

Aggregate: \$25,000,000

The umbrella policy will be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products policies.



DENVER FIRE DEPARTMENT PIERCE 107' HEAVY DUTY AERIAL LADDER



The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Manufacturer agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as the certificate holder.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pump house (including the sheet metal enclosure, valve controls, piping and operators panel) body and aerial device will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

SPECIAL INSTRUCTIONS

The apparatus will be designed and built to match the Velocity 105' ladder job #29636 in some aspects, pictures provided. However, some variation may be necessary due to changes in our manufacturing processes or our product offering. Revisions in NFPA guidelines and/or other regulations may also affect our ability to match the previous unit.

NFPA 2016 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.



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All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the customer approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the document as "non-NFPA".

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

INSPECTION CERTIFICATE

A third party inspection certificate for the aerial device will be furnished upon delivery of the aerial device. The certificate will be Underwriters Laboratories Inc. Type 1 and will indicate that the aerial device has been inspected on the production line and after final assembly.

Visual structural inspections will be performed on all welds on both aluminum and steel ladders.

On critical weld areas, or on any suspected defective area, the following tests will be conducted:



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- Magnetic particle inspection will be conducted on steel aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. Magnets will be placed on each side of the weld while iron powder is placed on the weld itself. The powder will detect any crack that may exist. This test will conform to ASTM E709 and be performed prior to assembly of the aerial device.
- A liquid penetrant test will be conducted on aluminum aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. This test will conform to ASTM E165 and be performed prior to assembly of the aerial device.
- Ultrasonic inspection will be conducted on all aerials to detect any flaws in pins, bolts and other critical mounting components.

In addition to the tests above, functional tests, load tests, and stability tests will be performed on all aerials. These tests will determine any unusual deflection, noise, vibration, or instability characteristics of the unit.

PUMP TEST

The pump will be tested, approved and certified by Underwriter's Laboratory at the manufacturer's expense. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the manufacturer's record of pump construction details will be forwarded to the Fire Department.

GENERATOR TEST

If the unit has a generator, the generator will be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be



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accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this document. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

A drawing of the apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.



DENVER FIRE DEPARTMENT PIERCE 107' HEAVY DUTY AERIAL LADDER



FINAL DRAWING

There will be a revised drawing of the truck with all the changes made during production provided at pickup.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

VELOCITY CHASSIS

The Pierce Velocity® is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus will be 11'-6".

WHEELBASE

The wheelbase of the vehicle will be 250.50".

GVW RATING

The gross vehicle weight rating will be 70,800 pounds.

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

FRAME REINFORCEMENT

In addition, a full-length mainframe internal "C" liner will be provided. The liner will be an internal "C" design that steps to a smaller internal "C" design over the rear axle. It will be heat-treated steel measuring 12.50" x 3.00" x 0.25" through the front "C" portion of the liner, stepping to 9.38" x 3.00" x 0.25" through the rear "C" portion of the liner. Each liner will have a section modulus of 13.58 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 4,391,869 in-lb.



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The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be 0 degrees for optimum tire life.

The ball joint bearing will be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.



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The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

FRONT OIL SEALS

Oil seals with viewing window will be provided on the front axle.

FRONT TIRES

Front tires will be Goodyear® 425/65R22.50 radials, 20 ply G296 MSA tread, rated for 22,800 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 12.25" polished aluminum disc type wheels with a ten (10)stud, 11.25" bolt circle.

REAR AXLE

The rear axle will be a Meritor™, Model RT-46-160, tandem axle assembly with a capacity of 48,000 lb.

An inter-axle differential, which divides torque evenly between axles, will be provided with an indicator light mounted on the cab instrument panel.

TOP SPEED OF VEHICLE

A rear axle ratio of 6.14 will be furnished. The engine will be programmed to limit the overall top speed to 60 MPH.



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REAR SUSPENSION

Rear suspension will be a Hendrickson Model FMX 482 EX, air ride with a ground rating of 48,000 lb. The suspension will have the following features:

- Outboard vertical mounted heavy-duty shock absorbers
- Utilizes track bars and torque rods to restrict lateral axle movement and maintain constant pinion angles
- Super heavy-duty transverse beam to help reduce axle stress while increasing roll stability or resistance to lean
- Low spring rate air springs for excellent ride quality
- Dual height control valves to maintain level vehicle from side to side

REAR OIL SEALS

Oil seals will be provided on the rear axle(s).

DRIVER CONTROL DIFFERENTIAL LOCK (DCDL)

The rear axle of the rear tandem axle will be equipped with a driver controlled differential lock (DCDL). The control will be located within easy reach of the driver.

REAR TIRES

Rear tires will be eight (8) Goodyear 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 54,240 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa© 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE PRESSURE MANAGEMENT

There will be a RealWheels LED AirSecure™ tire alert pressure management system provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of 10 tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops 5 to 8 psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.



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FRONT HUB COVERS

Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

MUD FLAPS

Mud flaps with a Pierce logo will be installed behind the front and rear wheels.

TIRE, AIR PRESSURE EQUALIZATION

A Crossfire air pressure equalization system will be provided on the rear dual wheels. This system will equalize the tire air pressure in the rear duals.

STABILIZER SYSTEM (REAR VALVE STEMS)

A valve stem stabilizer system will be provided on the rear duals.

WHEEL CHOCKS

There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS

There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted forward of the left side rear tire.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 6S6M, anti-lock braking system. The ABS will provide a six (6) channel anti-lock braking control on both the front and rear wheels. A digitally



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controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. An "off road traction" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system will be full air type.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

BRAKE SYSTEM AIR COMPRESSOR

The air compressor will be a Cummins/WABCO with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Bendix dual brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 6,653 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi



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- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, will be provided with an automatic spring brake application at 40 psi
- A pressure protection valve will be provided to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa).
- 1/4 turn drain valves on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

- Bendix AD-9 air dryer, with heater and coalescing filter

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AIR INLET

One (1) air inlet with 3D series male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located rearward in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female fitting will also be provided with the loose equipment.

AIR OUTLET

One (1) air outlet will be installed with a female coupling and shut off valve, located in the front body compartment on driver side. This system will tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Female coupling and male fitting will be .25" thread.

A mating male fitting will be provided with the loose equipment.



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AIR HOSE

There will be two (2) 25' length(s) of air hose furnished with fittings.

An air chuck will be provided with the air hose. The air chuck will fit the valve stems that are provided on the tires.

ALL WHEEL LOCK-UP

An additional all wheel lock-up system will be installed which applies air to the front brakes only. The standard spring brake control valve system will be used for the rear.

ADDITIONAL AIR TANK

An additional air tank with 1,454 cubic inch displacement will be provided to increase the capacity of the air system. This tank will be dedicated for air horn use.

The air tank will be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

The output flow of the engine air compressor varies with engine rpm. Full compressor output is only achieved at governed engine speed. Engine speed may be limited by generators, pumps and other PTO driven options.

COMPRESSION FITTINGS

Any nylon tube on the apparatus that is pneumatic will be plumbed with compression type fittings where applicable.

ENGINE

The chassis will be powered by an electronically controlled engine as described below:

Make:	Cummins®
Model:	X12
Power:	500 hp at 1800 rpm
Torque:	1645 lb-ft at 1200 rpm
Governed Speed:	2100 rpm
Emissions Level:	EPA 2016
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	729 cubic inches (11.9L)
Starter:	Delco 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor.



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	Secondary spin-on style filter.
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The engine will include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

REPTO DRIVE

A rear engine power take off will be provided to drive the water pump. A vibration dampener will be provided between the REPTO and water pump. Transmission PTO's used to drive the water pump will not be allowed due to their lower torque ratings. The rear engine power take off will be the same as used extensively throughout the construction industry. Rear engine PTO's allow for continuous 240 hp and 480 lb-ft torque ratings needed for large pump applications. The rear engine power take off will have the same warranty as the engine provided by the engine manufacturer.

HIGH IDLE

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver will be able to turn the engine brake system on/off and have high and low setting.

The high setting of the brake application will activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

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



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CLUTCH FAN

A Horton® fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position. A compression fitting will be provided on the fan hub.

ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipes between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The last 18.00" of the tail pipe will be at a 35 degree angle and without any restriction of hangers or clamps to ensure an easy deployment of an exhaust extraction hose.

RADIATOR

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

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the



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development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will 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.

A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates® silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer.

The chassis manufacturer will also use Gates brand hose on other heater, defroster and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances a comparable silicone hose from another manufacturer will be used.

Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

RADIATOR SKID PLATE

A lower radiator skid plate will be supplied for protection. The skid plate shall be constructed of .25" steel plate.

VINYL WINTER FRONT

A custom one-piece white vinyl winter front will be provided for use in extreme cold weather. The vinyl will cover the front cab grille and will be held in place with quarter turn fasteners. There will be an 5.50" x 16.00" opening in the center for proper ventilation.

FUEL TANK

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A 0.75" drain plug will be located in a low point of the tank for drainage.



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A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

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

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the driver's side of the body and be covered with a hinged, spring loaded, polished stainless steel door that is marked "Diesel Exhaust Fluid Only".

The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

AUXILIARY FUEL PUMP

An auxiliary electric fuel pump will be added to the fuel line for priming the engine. A switch located on the cab instrument panel will be provided to operate the pump.

FUEL SHUTOFF

A fuel line shutoff valve will be installed on both the inlet and outlet of the primary fuel filter.

FUEL COOLER

An air to fuel cooler will be installed in the engine fuel return line.

FUEL SEPARATOR

The engine will be equipped with a Racor in-line spin-on fuel and water separator in addition to the engine fuel filters.

TRANSMISSION

An Allison 5th generation, model EVS 4000PR, electronic, torque converting, automatic transmission with retarder will be provided.



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Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge, with red light and audible alarm, will be installed on the cab instrument panel.

The transmission retarder control will be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.

The transmission will have the 1600 ft. lb. torque (medium) spring setting for retardation force.

The transmission retarder will have a master "on/off" switch on the instrument panel. A red indicator light will be provided to warn that the transmission is being overworked.

The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.

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

TRANSMISSION SHIFTER

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be:

1st	3.51 to 1.00
2nd	1.91 to 1.00
3rd	1.43 to 1.00
4th	1.00 to 1.00
5th	0.75 to 1.00
6th	0.64 to 1.00
R	4.80 to 1.00

TRANSMISSION PROGRAMMING

The transmission will be programmed to automatically shift the transmission to neutral when the parking brake is set to simplify operation and increase operational safety.

TRANSMISSION COOLER

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The internal bar plates will be constructed of



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stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission retarder oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

DOWNSHIFT MODE (W/ENGINE BRAKE)

The transmission will be provided with an aggressive downshift mode.

This will provide earlier transmission downshifts to 2nd gear from 6th gear, resulting in improved engine braking performance.

TRANSMISSION FLUID

The transmission will be provided with TranSynd heavy duty synthetic transmission fluid.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

STEERING

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.



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LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: Denver

The second row of text will be: Fire

The third row of text will be: Department

AUTOMATIC CHASSIS LUBRICATION

A Vogel Automatic Lubrication System will be provided. The lubrication will be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations listed. The electronic control unit that forms part of the system will activate the pump after an adjustable interval time. The unit will control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.

The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, will be located reservoir will be in between the boom supports on the apparatus.

- TAK- 4 Control Arm Pivot Points
- Rear Axle Slack Adjusters
- Rear Axle Brake Cam Screws
- Rear Suspension Spring Pins
- Rear Suspension Shackle Pins

BUMPER

A one (1) piece, ten (10) gauge, 304-2B type polished stainless steel bumper, minimum of 10.00" high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper will be extended 16.00" from front face of cab.

Documentation will be provided, upon request to show that the options selected have been engineered for fit up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to the following options: air



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horns, mechanical sirens, speakers, hose trays with hose capacities, winches, lights, discharge, and suction connections.

GRAVEL PAN

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

CENTER TOOL TRAY

A tool tray, constructed of aluminum, will be placed in the center of the bumper extension.

Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.

CENTER TOOL TRAY COVER

A bright aluminum treadplate cover will be provided over the center tool tray.

The cover will be attached with a stainless steel hinge.

There will be two (2) flush lift and turn latches provided to secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes will be painted the same color as the frame.

TOW HOOKS

No tow hooks are to be provided. This truck will be equipped with a lift and tow package with integral tow eyes.

CAB

The Velocity cab will be designed specifically for the low mount, rear mount aerial fire service and will be manufactured by the chassis builder.

To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar



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will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be a full-tilt style. A three (3)-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab roof will be provided with a 58.00" wide notch that lowers the center section of the cab roof by 3.00". The deep notch will continue from the front of the cab and extend full length to the rear of the cab. The deep notch will accommodate a low mount aerial device, and provide lower overall vehicle height.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.



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To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 50.95" in the center position and 68.75" in the outboard positions.

The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

CAB PUMP ENCLOSURE

The rear of the cab will be made to house the fire pump below the forward facing crew cab seats. The cab side panels will be notched to accommodate the pump panel.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

Full-circular, aluminum, inner fender liners in the wheel wells will be provided.

PANORAMIC WINDSHIELD

A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also



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provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of .50" aluminum plate that is welded to both the .25" firewall and .38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

CAB LIFT

A hydraulic cab lift system will 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 hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.



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The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.

FRONT CAB TRIM

A band of 22 gauge brushed stainless steel trim will be installed across the front of the cab, from door hinge to door hinge. The trim band will be centered on the head lights and applied with two (2)-sided tape. A 0.625" self adhesive trim strip will be applied around the perimeter of the trim band.

There will be no covers provided over the painted cab corner where the cab turn signals are located.

SIDE OF CAB MOLDING

Chrome molding will be provided on both sides of cab.

MIRRORS

For enhanced visibility, safety and overall aesthetics, a forward positioned One-Eleven custom mirror will be mounted on each side of the front cab roof corner. Both front cab roof corners will be reinforced with an aluminum casting at the mounting location providing maximum stability for the mirror arm and head assembly. The mirror arm substructure will extend forward and outward of the cab and will be constructed out of 4.00" diameter, 0.25" wall, aluminum



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tubing. For reduced service cost, the mirror will include a dual breakaway design, controlled by a rotational detent mechanism. In the event of an impact, the mirror arm will breakaway to either the inboard or the outboard position. The One-Eleven mirror head, and injection molded arm cover, will offer a sleek aerodynamic styling with overall width of 115.80" (reduces vehicle width by 7.00" when compared to door mount bus style mirrors). The arm cover finish will be chrome. The mirror head finish will be chrome. The mirror head and arm will provide a seamless appearance, and include a black painted metal cover plate on the underside of the arm to reduce glare. For maximum visibility and safety, a flat mirror section will be provided that measures 83 square inches in reflective area. There will also be an integral convex mirror section that will measure 27 square inches in reflective area. The flat glass and convex section in each mirror will be heated and adjustable with remote controls that are convenient to the driver.

CAB DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 76.46" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab doors will measure a minimum of 37.87" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.

The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 751. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.



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A chrome grab handle will be provided on the inside of each cab and crew cab door.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

Door Panels

The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high x 4.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door.

The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps.

CAB EXTERIOR HANDRAILS

A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.



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STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

The lights will be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high.

WINDOWS INTERIOR TRIM

For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.

CAB INTERIOR

With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

The center console will be a high impact ABS polymer and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield.

The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting



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for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be 36 oz dark silver gray vinyl. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

CAB INTERIOR PAINT

The following metal surfaces will be painted black, vinyl textured paint:

- Modesty panel in front of driver
- Vertical surface of dash in front of the officer (not applicable for recessed dash)
- Glove box in front of the officer (if applicable)
- Power distribution in front of the officer
- Rear heater vent panels

The remaining cab interior metal surfaces will be painted gray, vinyl texture paint.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.



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CAB DEFROSTER

To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable metal cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

CAB/CREW CAB HEATER

Two (2) 36,702 BTU auxiliary heaters with 276 SCFM (each unit) of air flow will be provided inside the crew cab, one (1) in each outboard rear facing seat riser. The heaters will include high performance dual scroll blowers, one (1) for each unit. Outlets for the heaters will be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions.

The heater/defroster and crew cab heaters will be controlled by an integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear independently. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature.

AIR CONDITIONING

Due to the large space inside the cab, a high-performance, customized air conditioning system will be furnished. A 19.10 cubic inch compressor will be installed on the engine.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof. The fans will be mounted on top of the condenser. The condenser cover and mounting legs to be painted white as provided by the A/C manufacturer.



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The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

The evaporator unit will have a 49,000 BTU (4.08 tons) rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the evaporator cover per the following:

- Four (4) will be directed towards the drivers location
- Four (4) will be directed towards the officers location
- Eight (8) will be directed towards crew cab area

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

The air conditioner will be controlled by dual zone integral electronic control panels for the heater, defroster and air conditioner. The cab control panel will be located in the center console. For ease of operation, the control panels will include variable adjustment for temperature and fan control.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a 0.20" high density polyethylene corrugated material. Each headliner will be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control.

Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide and R-value of 4 per 1.00" thickness.

AIR CONDITIONING CONDENSER BRUSH GUARD/COVER

A brush guard/cover will be provided over the air conditioning condenser, on the cab roof. The brush guard will protect the air conditioning condenser from tree limbs, etc. The guard will also allow a fire fighter or maintenance personnel to step over the condenser without damaging the fiberglass housing.

The brush guard/cover will be constructed of aluminum treadplate. The guard will have several 1.00" x 2.00" knockouts to allow for adequate airflow around condenser.



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SUN VISORS

Two (2) smoked Lexan™ sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver side and passenger side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

CAB SAFETY SYSTEM

The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.



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- A driver side front air bag will 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.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag
- Passenger side knee bolster air bag
- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SIDE ROLL PROTECTION

The SRS system will provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system will deploy the following components in the event of a side roll:



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- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SEATING CAPACITY

The seating capacity in the cab will be six (6).

DRIVER SEAT

A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER SEAT

A Pierce PS6® seat will be provided in the cab for the passenger. The seat will be a cam action type with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not belted.



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The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A compartment for the radio amplifier will be located on the floor of the cab behind the front passenger seat. A lift-up door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior.

REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle. It will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.



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The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt and firmly hold the occupant in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING CENTER SEATS

There will be two (2) forward facing, Pierce PS6® seats provided at the center position in the crew cab. For optimal comfort, the seats will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat backs will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats will include the following feature incorporated into the side roll protection system:



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- A seat safety system will be included. When activated, this system will pretension the seat belts around the occupants to firmly hold them in place in the event of a side roll.

The seats will be furnished with 3-point, shoulder type seat belts. The seat belts will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

SEAT UPHOLSTERY

All Pierce PS6 seat upholstery will be gray woven with black Imperial 1200 material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of five (5) SCBA brackets.

SEAT BELTS

All seating positions in the cab, crew cab and tiller cab (if applicable) will have red seat belts.

To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

A total of five (5) seating positions will have the adjustable shoulder harness.

HELMET HOLDER

There will be a total of five (5) Zico, Model UHH-1, helmet holder bracket(s) provided in the cab. The brackets will provide secure storage and quick access to each helmet. The location of the helmet holder bracket(s) will be determined at the time of final inspection.



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CAB DOME LIGHTS

There will be four (4) Weldon 808* series, dual LED dome lights with grey bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white .

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

OVERHEAD MAP LIGHTS

There will be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light will include a switch on the light housing.

The light switches will be connected directly to the battery switched power.

CAB SPOTLIGHT

There will be two (2) Golight® Stryker™, Model 30**4, white LED spotlights located on the cab roof, one each side. The spotlights will be mounted on painted pedestals.

These lights may be load managed when the parking brake is applied.

SPOTLIGHT CONTROLLER

There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlights will be located one (1) within reach of the driver overhead and one (1) within reach of the officer overhead.

HAND HELD LIGHT

There will be four (4) Streamlight, Fire Vulcan, Model #44451, hand lights provided with a vehicle mount with 12VDC direct wire charging rack and quick release buckle strap mounted shipped loose.

Each light housing will be orange in color and be provided with a C4, LED and two (2) "ultra bright blue tail light LEDs" The tail light LEDs will have a dual mode of blinking or steady.



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CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

GAUGES

The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (Volts)

- Low volts (11.8 VDC)

- Amber indicator on gauge assembly with alarm

- High volts (15 VDC)

- Amber indicator on gauge assembly with alarm

- Very low volts (11.3 VDC)

- Amber indicator on gauge assembly with alarm

- Very high volts (16 VDC)

- Amber indicator on gauge assembly with alarm

- Tachometer (RPM)

- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

- Fuel level gauge (Empty - Full in fractions)

- Low fuel (1/8 full)

- Amber indicator on gauge assembly with alarm

- Very low fuel (1/32) fuel

- Amber indicator on gauge assembly with alarm



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- Engine oil pressure gauge (PSI)

- Low oil pressure to activate engine warning lights and alarms

- Red indicator on gauge assembly with alarm

- Front air pressure gauge (PSI)

- Low air pressure to activate warning lights and alarm

- Red indicator on gauge assembly with alarm

- Rear air pressure gauge (PSI)

- Low air pressure to activate warning lights and alarm

- Red indicator on gauge assembly with alarm

- Transmission oil temperature gauge (Fahrenheit)

- High transmission oil temperature activates warning lights and alarm

- Amber indicator on gauge assembly with alarm

- Engine coolant temperature gauge (Fahrenheit)

- High engine temperature activates an engine warning light and alarm

- Red indicator on gauge assembly with alarm

- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)

- Low fluid (1/8 full)

- Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:



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- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn



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- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect



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the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.



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Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

CUSTOM SWITCH PANELS

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

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

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)



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CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm shall be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck



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- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliques. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of



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each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

HOURLMETER - AERIAL DEVICE

An hourmeter for the aerial device will be provided and located within the cab display or instrument panel.

AERIAL MASTER

There will be a master switch for the aerial operating electrical system provided.

AERIAL PTO SWITCH

A PTO switch for the aerial with indicator light will be provided.

SPARE CIRCUIT

There will be four (4) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate on the officer's side of the engine tunnel
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125 percent of the protection

The circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power



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- The negative wire will be connected to ground
- Wires will be protected to 20 amps at 12 volts DC
- Power and ground will terminate in the electronics box over the engine behind panel #9 rearward
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125% of the protection

This circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

The positive wire will be connected directly to the battery power.

The negative wire will be connected to ground.

Wires will be protected to 15 amps at 12 volts DC.

Power and ground will terminate on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical recessed - See Pictures.

Termination will be with 15 amp, power point plug with rubber cover.

Wires will be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

RECESS, DASH PANEL

The dash panel across from the officer will be recessed to accommodate the mounting of miscellaneous items. The recess will be 8.25" down x 7.81" back and 20.88" wide.

INFORMATION CENTER

An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens



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- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

HOME/TRANSIT SCREEN

This screen will display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)
- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer



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- Active Alarms

ON SCENE SCREEN

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

VIRTUAL BUTTONS

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

PAGE SCREEN

The page screen will display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
 - Faults
 - Listed by order of occurrence
 - Allows to sort by system
 - Interlock
 - Throttle Interlocks
 - Pump Interlocks (if equipped)
 - Aerial Interlocks (if equipped)
 - PTO Interlocks (if equipped)
 - Load Manager
 - A list of items to be load managed will be provided. The list will provide a description of the load.
 - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.



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- The screen will indicate if a load has been shed (disabled) or not shed.
 - "At a glance" color features are utilized on this screen.
 - Systems
 - Command Zone
 - Module type and ID number
 - Module Version
 - Input or output number
 - Circuit number connected to that input or output
 - Status of the input or output
 - Power and Constant Current module diagnostic information
 - Foam (if equipped)
 - Pressure Controller (if equipped)
 - Generator Frequency (if equipped)
 - Live Data
 - General Truck Data
- Maintenance
 - Engine oil and filter
 - Transmission oil and filter
 - Pump oil (if equipped)
 - Foam (if equipped)
 - Aerial (if equipped)
- Setup
 - Clock Setup
 - Date & Time
 - 12 or 24 hour format
 - Set time and date
 - Backlight
 - Daytime
 - Night time
 - Sensitivity
 - Unit Selection
 - Home Screen
 - Virtual Button Setup
 - On Scene Screen Setup
 - Configure Video Mode
 - Set Video Contrast
 - Set Video Color
 - Set Video Tint



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- Do Not Move
 - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicate
 - Driver Side Cab Door
 - Passenger's Side Cab Door
 - Driver Side Crew Cab Door
 - Passenger's Side Crew Cab Door
 - Driver Side Body Doors
 - Passenger's Side Body Doors
 - Rear Body Door(s)
 - Ladder Rack (if applicable)
 - Deck Gun (if applicable)
 - Light Tower (if applicable)
 - Hatch Door (if applicable)
 - Stabilizers (if applicable)
 - Steps (if applicable)
- Notifications
 - View Active Alarms
 - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
 - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

VEHICLE DATA RECORDER

There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:



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- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

The seat belt monitoring screen will become active on the Command Zone color display when:

- The home screen is active:
 - and there is any occupant seated but not buckled or any belt buckled with an occupant.
 - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

RADIO ANTENNA MOUNT

There will be one (1) standard antenna-mounting base(s), Model MATM, with 17 feet of coax cable and weatherproof cap provided for a two (2)-way radio installation. The standard mount will be located on the cab roof, just to the rear of the officer seat and the additional mount(s) will be located routed to the office seat box. The cable(s) will be routed routed to the office seat box .



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VEHICLE CAMERA SYSTEM

There will be a color vehicle camera system provided with the following:

- One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse

The camera images will be displayed on the driver's vehicle information center display. Audio from the microphone on the active camera will be not provided.

The following components will be included:

- One (1) SV-CW134639CAI, camera
- One (1) amplified speaker (if applicable)
- All necessary cables

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

SOLID-STATE CONTROL SYSTEM

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.



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The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit



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protection information (where applicable), wire numbers, wire colors and load management information.

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

The on-board information center will include the following diagnostic information:

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

TECH MODULE WITH WIFI

An in cab module will provide WiFi wireless interface and data logging capability. The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

The data logging capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

PROGNOSTICS

A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events.



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The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics will include:

- Engine oil and filter
- Transmission oil and filter
- Pump oil (if equipped)
- Foam oil (if equipped)
- Aerial oil and filter (if equipped)

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

VOLTAGE MONITOR SYSTEM

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

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

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

- The studs will consist of the following:
- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.



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ENHANCED SOFTWARE

The solid-state control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors



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will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.
6. All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

Five (5) 12 volt, Exide Model 31S750X3W, group 31 batteries that include the following features will be provided:

- 750 CCA, cold cranking amps
- 180 amp reserve capacity
- High cycle
- Rating of 3000 CCA at 0 degrees Fahrenheit
- 720 minutes of reserve capacity



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- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

BATTERY CHARGER

There will be a Kussmaul™ 1200, Model 091-187-12-Remote, battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to the battery charger.



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The battery charger will be located in the left body compartment mounted on the back wall as high as possible.

The battery charger indicator will be located near the driver's seat riser with special bracketry.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul Model 091-55-15-120, 15 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus without the use of the generator.

The shoreline inlet(s) will include yellow weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline(s) will be connected to the battery charger and six place receptacle in the cab.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side rear bulkhead of body.

COVER IO MODULE

A cover will be fabricated and installed to the rear face of the driver side battery box to cover the electrical IO modules for protection. The cover will protect the modules from the outside elements as much as possible without having to be water tight.

ALTERNATOR

A C.E. Niehoff, model C680-1, alternator will be provided. It will have a rated output current of 430 amp as measured by SAE method J56. It will also have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.



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WEATHER PACK CONNECTORS SEALED

All unused open Weather Pack connectors will be plugged with mating tower and shroud connectors and cavity plugs.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
 - If enabled:
 - "Load Man Hi-Idle On" will display on the information center.
 - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
 - ON = not shed
 - SHED = shed



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SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will 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.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

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

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

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome trim housing on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS

There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.



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INTERMEDIATE LIGHT

There will be four (4) Truck-Lite, kit number 30085Y with Model 30375Y 2.24" round LED rubber grommet mount lamps and plugs mounted, two (2) each side in the rear fender panel. One each side with the forward light acting as a turn signal and the rearward light acting as a marker light.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Truck-Lite®, Model 35200R, LED lights used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed on the side of the apparatus as marker lights as close to the rear as practical per the following:



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- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

MARKER LIGHTS

There will be one (1) pair of amber and red LED marker lights with rubber arm, located at the rear most lower corner of the body. The amber lens will face the front and the red lens will face the rear of the truck.

These lights will be activated with the running lights of the vehicle.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

- Two (2) Whelen®, Model M6BTT, red LED stop/tail lights
- Two (2) Whelen, Model M6T, amber LED arrow turn lights

The lights shall be provided with color lenses.

Each light will be installed separately at the rear with Whelen, Model M6FC, chrome flanges.

Two (2) Whelen Model M6BUW, LED backup lights, will be provided with a flange.

LICENSE PLATE BRACKET

There will be one (1) Weldon, Model 0J10-0393-00, license plate bracket located below the tailboard on a removable bolt-on bracket located driver side.

A Weldon, Model 9186-23882-30, incandescent step light will illuminate the license plate.



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BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

BACK-UP OBSTACLE SENSING SYSTEM

A SenseStat ultrasonic backing sensor system with 4 individual zones and an LED distance display will be provided.

The system will detect objects that are up to eight (8) feet from the rear of the vehicle reading each of four (4) separate sensors, and displaying the distance to the one that is closest to an object.

A 3.5"W x 2.9"L x 1.6"H, four (4) column color LED display located next to driver, see customer marked up IP layout will show the direction and location of the obstacle. The display will show the distance from the sensor to the obstacle in meters or in feet & fractions of a foot to the sensor that is closest to an object. There will be an audible alarm with volume control integrated into the display.

PERIMETER SCENE LIGHTS, CAB

There will be a Truck-lite, Model 44310C, 4.00", 12 volt DC white LED light, with Model 40700 grommet mount and Model 95948 pigtail provided for each cab door. Lighting will be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which will be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

PUMP HOUSE PERIMETER LIGHTS

There will be two (2) Truck-Lite, Model 44310C, 4.00" white LED 12 volt DC weatherproof lights with Model 40700, grommets provided under the pump panel running boards, one (1) each side.

The lights will be controlled by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS

There will be one (1) Truck-Lite, Model 44308C, 4.00" white LED lights with Model 40700, grommets provided under the turntable access steps.

The perimeter scene lights will be activated when the parking brake is applied.

STEP LIGHTS

There will be two (2) white LED step lights provided, one (1) on each side of the front body.



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In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

These step lights will be actuated when the ignition switch is on and the parking brake is set.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

12 VOLT LIGHTING

There will be one (1) Whelen® Pioneer™ SlimLine™, Model PSL2*, 12 volt LED spotlight(s) provided on the front visor, centered.

The painted parts of this light assembly to be white.

The light(s) will be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- no additional switch location

These light(s) may be load managed when the parking brake is applied.

REAR SCENE LIGHT(S)

There will be two (2) Whelen®, Model M6ZC, LED scene light(s) with chrome flange(s) installed at the rear of the apparatus, one (1) high on the driver's side rear body bulkhead and one (1) high on the passenger's side rear body bulkhead.

The light(s) will be controlled by a switch at the driver's side switch panel.

The light(s) may be load managed when the parking brake is applied.

12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model P*H1*, 8,875 lumens 12 volt DC powered lights with white LEDs and flood optics installed on the apparatus located, high and rearward of passenger side crew cab door.

The light(s) to be installed in a 15 degree vertical recessed bracket.

The painted parts of this light assembly to be white.

The lights will be activated by a switch at the driver's side switch panel.

The light(s) may be load managed when the parking brake is applied.



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12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model P*H1*, 8,875 lumens 12 volt DC powered lights with white LEDs and flood optics installed on the apparatus located, high and rearward of driver's side crew cab door.

The light(s) to be installed in a 15 degree vertical recessed bracket.

The painted parts of this light assembly to be white.

The lights will be activated by a switch at the driver's side switch panel.

The light(s) may be load managed when the parking brake is applied.

DECK LIGHTS

There will be two (2) Whelen®, Model MPPBCS, black with chrome housing 12 volt DC LED floodlights with on/off switch. Each light will be provided with a low profile pedestal/swivel mount provided at the rear of the hose bed, one (1) each side.

The lights will be activated by the switch included on the light(s).

WALKING SURFACE LIGHT

There will be Model FRP, 4" round black 12 volt DC LED floodlight(s) with bolt mount provided to illuminate the entire designated walking surface on top of the body.

The light(s) will be activated when the body step lights are on.

WATER TANK

It will have a capacity of 300 gallons and will be constructed of polypropylene plastic in a rectangular shape.

The joints and seams will be nitrogen welded inside and out.

The tank will be baffled in accordance with NFPA Bulletin 1901 requirements.

The baffles will have vent openings at both the top and bottom of each baffle to permit movement of air and water between compartments.

The longitudinal partitions will be constructed of .38" polypropylene plastic and extend from the bottom of the tank through the top cover to allow positive welding.

The transverse partitions extend from 4" off the bottom to the underside of the top cover.

All partitions interlock and will be welded to the tank bottom and sides.

The tank top will be constructed of .50" polypropylene.



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It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.

It will be supported to keep it rigid during fast filling conditions.

Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions.

Two of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump will be provided at the bottom of the water tank. The sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated "cradle" assembly constructed of structural steel.

Sufficient crossmembers are provided to properly support bottom of tank.

Crossmembers are constructed of steel bar channel or rectangular tubing.

Tank "floats" in cradle to avoid torsional stress caused by chassis frame flexing.

Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

Stops are provided to prevent an empty tank from bouncing excessively while moving vehicle.

Tank mounting system is approved by the manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

HOSE BED

The hose bed will be fabricated of .125"-5052-H32 aluminum with a nominal 31,000 psi tensile strength.

The sides will not form any portion of the fender compartments.

The hose bed will be located ahead of the ladder turntable.



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Hose removal will be at the rear of the body via "chutes" under the turntable on the left side. Each chute will be enclosed with a full height smooth aluminum. There will be a lift and turn latch, and a pneumatic cylinder at the top of the door (if applicable).

The hose bed flooring will consist of removable aluminum grating with a top surface that is corrugated to aid in hose aeration.

The grating slats will be 0.50" x 4.50" with spacing between slats for hose ventilation.

Hose capacity will be a minimum of 600' of 3.00 inch.

AERIAL HOSE BED HOSE RESTRAINT

The hose in the hose bed will be restrained by one (1) black nylon Velcro® strap at the top of the hose bed. The strap will be installed to the top of the hose bed side sheets.

HOSE BED HOSE RESTRAINT

A red hose bed cover will be furnished with jacket snaps fasteners at the front and jacket snap fasteners on the sides.

RUNNING BOARDS

A running board will be provided on each side of the front body to allow access to the backboard/crosslay storage area. The running boards will be designed with a grip pattern punched into .125" bright aluminum treadplate material providing support, slip resistance, and drainage.

The runningboard will have a flip out section design that allows easier access to the full width equipment area above. The flip out section will be tied to the "do not move truck indicator" with a sensor when it is flipped out. There will be a latch provided that secures the flip out section when not in use.

HANDRAILS

The handrails will be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

- Two (2) handrails will be provided, one above each running board.



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TURNTABLE STEPS

Steps to access the turntable from the left side will be provided just behind the compartmentation. The steps will be a swing-down design, with the stepping area made of Morton Tread-Grip® channel. The step height for the bottom step (the distance from the top surface of the step to the ground) will not exceed 24.00" with the step in its extended position. No step height (the distance between the top surfaces of any two (2) adjacent steps) will be greater than 14.00". The stepwell will be lined with bright aluminum treadplate to act as scuffplates. The steps will be connected to the "Do Not Move Truck" indicator. A handrail will be provided on each side of the access steps. A hand hold will be provided in the left and right side of each side of the access steps.

STEP LIGHTS

There will be three (3) white LED step lights provided for the aerial turntable access steps.

In order to ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The step lights will be actuated by the aerial master switch in the cab.

SMOOTH ALUMINUM REAR WALL

The rear wall will be smooth aluminum.

TOW EYES

Two (2) rear chrome plated tow eyes will be located at the rear of the apparatus and will be mounted directly to the torque box. The inner and outer edges of the tow eyes will be radiused.

COMPARTMENTATION

Compartmentation will be fabricated of 0.125" 5052 aluminum. The side compartments are an integral assembly with the rear fenders. Fully enclosed rear wheel housings will be provided to prevent rust pockets and for ease of maintenance. Due to the severe loading requirements of this aerial, a method of compartment body support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rail, which is the strongest component of the chassis and is designed for sustaining maximum loads.

A support system will be used which will incorporate a floating substructure by using Neoprene Elastomer isolators to allow the body to remain rigid while the chassis goes through its natural flex. The isolators will have a broad range of proven viability in vehicular applications, be of a fail safe design, and allow for all necessary movement in three (3) transitional and rotational modes. This will result in a 500 lb equipment rating for each lower compartment of the body.



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The compartmentation in front of the rear axle will include a 3.00" steel support assemblies which are bolted to the chassis frame rails. A steel framework will be mounted to the body above these support assemblies connected to the support assemblies with isolators. There will be one (1) support assembly mounted to each chassis frame rail.

The compartmentation behind the rear axle will include 3.00" steel support assemblies which are bolted to the chassis frame rails and extend underneath to the outside edge of the body. The support assembly will be coated to isolate the dissimilar metals before it is bolted to the body. There will be one (1) support assembly mounted to each chassis frame rail.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. The compartment door openings are framed by flanging the edges in 1.75" and bending out again 0.75" to form an angle. Drip protection is provided over all door openings by means of bright aluminum extrusion or formed bright aluminum treadplate. Side compartment tops will be covered with bright aluminum treadplate with a 1.00" rolled over edge on the front, rear and outward side. The covers are fabricated in one (1) piece and have the corners welded. A bright aluminum treadplate cover will be provided on the front wall of each side compartment. All screws and bolts which protrude into a compartment will have acorn nuts at the ends to prevent injury.

The body design has been fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, stress coating and strain gauging have been performed with special attention given to fatigue life and structural integrity of the compartment body and substructure.

AGGRESSIVE WALKING SURFACE

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

LOUVERS

All body compartments will have a minimum of one (1) set of louvers stamped into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers will be formed into the metal and not added to the compartment as a separate plate.

LEFT SIDE COMPARTMENTATION

A full height roll-up door compartment ahead of the rear wheels will be approximately 41.75" wide x 64.00" high x 24.25" deep inside with an clear door opening of approximately 38.75" wide x 56.38" high.



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One (1) roll-up door compartment above the fender compartments and over the rear axles will be provided. The compartment will be approximately 72.13" wide x 33.25" high x 24.25" deep inside with a clear door opening of approximately 63.75" wide x 25.50" high.

A compartment with a single pan stainless steel door will be located above the front stabilizer. The compartment will be approximately 23.00" high x 18.00" wide x 24.25" deep with a door opening of approximately 15.75" high x 12.00" wide.

There will be a notch in the rear wall of the compartment over the rear wheels to allow for a hose chute.

A full height roll-up door compartment behind the rear wheels will be approximately 43.75" wide x 49.25" high x 21.25" deep inside the lower 29.75" and 12.00" deep in the upper portion. The clear door opening will be approximately 40.75" wide x 41.62" high.

There will be one (1) compartment below the turntable with a roll-up door. The compartment will be approximately 39.38" wide x 18.38" high x 12.00" deep with a door opening of approximately 33.75" wide x 11.75" high.

RIGHT SIDE COMPARTMENTATION

A full height roll-up door compartment, ahead of the rear wheels, will be 41.75" wide x 64.00" high x 24.25" deep inside with a clear door opening of 38.75" wide x 56.38" high.

One (1) roll-up door compartment will be provided above the fender compartments and over the rear axles. The compartment will be 72.13" wide x 33.25" high x 24.25" deep inside with a clear door opening of 63.75" wide x 25.50" high.

A compartment with a single pan stainless steel door will be located above the front stabilizer. The compartment will be 18.00" wide x 23.00" high x 24.25" deep with a door opening of 12.00" wide x 15.75" high.

A full height roll-up door compartment, behind the rear wheels, will be 43.75" wide x 49.25" high x 21.25" deep. The clear door opening will be 40.75" wide x 41.62" high.

There will be a compartment, below the turntable, with a roll-up door. The compartment will be 39.38" wide x 18.38" high x 21.25" deep with a door opening of 33.75" wide x 10.75" high.

RIGHT SIDE COMPARTMENT IN PLACE OF TURNTABLE STEPS

A single door compartment in place of turntable stairs 12.00" deep x 20.88" wide x 49.25" high inside with a clear door opening of 16.50" wide x 45.75" high shall be provided.



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SIDE COMPARTMENT ROLL-UP DOORS

There will be nine (9) compartment doors installed on the side compartments, double faced, aluminum construction, satin aluminum and manufactured by AMDOR™ brand roll-up doors.

Door(s) will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.

The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of roll-up door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A stainless steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge to be supplied over lift bar for additional area to aid in closing the door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded roll-up door wear components will be constructed of Type 6 nylon.

Each roll-up door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

The header for the roll-up door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.



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COMPARTMENT BLISTER

A blister in the compartment ahead of the rear wheels will be provided to clear the front bracket of the Firemaax suspension. This blister will take away some of the interior area of the compartment.

REAR BUMPER

A 5.00" rear bumper will be furnished. Bumper will be constructed of steel framework and will be covered with polished aluminum treadplate. The treadplate will stop at the base of the steel framework, not extending underneath. The bumper will be 4.00" deep x 4.75" high and will be spaced away from the body approximately 1.00". It will extend the full width of the body.

REDUCED HEIGHT RUBBER DOOR STOP

The black rubber stops provided above the horizontal door ledge on the roll up doors located D2 and P2 will be trimmed so that the door can be opened as much as possible.

COMPARTMENT LIGHTING

There will be twelve (12) compartments with On Scene Solutions LED compartment light strips. The compartments with these strip lights will be located all body compartments. Two (2) strip lights will be installed vertically, one (1) each side of the compartment door opening. The lights will be sized to accommodate the compartment door opening.

The remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door, will automatically turn the compartment lighting on.

MOUNTING TRACKS

There will be six (6) sets of tracks for mounting shelf(s) in LS1, LS3, LS4, RS1, RS3 and RS4. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be six (6) shelves with a capacity of 500 lb provided.

The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.



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The location(s) will be in RS5 in the upper third, in RS4 in the upper third, in RS1 in the upper third, in LS4 in the upper third and in LS1 in the upper third.

COMPARTMENT IPO HOSE CHUTE

There will be one (1) compartment(s) located on the right side side of the body at the rear, in place of the hose chute. Each compartment will be approximately 10.00" wide x 46.00" deep. The rear 22.50" of length will be 16.00" high. The remaining forward length will be 14.00" high. Each compartment will have a smooth aluminum lift up door with a spring-loaded hinge and a pawl latch.

STORAGE COMPARTMENT

There will be two (2) bright aluminum treadplate compartment(s) provided above the top of body driver and passenger side side body compartments. The compartment will be approximately 18.50" deep x 24.00" wide x 116.00" long. A hinged aluminum treadplate hatch style cover with plunger latches will be provided. The compartment(s) will be hinged to the outside and the latches to the inside. The cover will be sealed for the weather and will be reinforced to allow it to be used as a walking surface. Two (2) chrome grab handles will be provided on each compartment to assist in opening and closing the cover. A gas cylinder will be provided on each end of the door to hold in the open position.

There will be a full length white 12 volt DC LED strip light installed on the inside edge of the compartment.

RUB RAIL

Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail.

Trim will be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

BODY FENDER CROWNS

Stainless steel fender crowns will be provided around the rear wheel openings.

A rubber welting will be provided between the body and the crown to seal the seam and restrict moisture from entering.

HARD SUCTION HOSE

Hard suction hose will not be required.



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SINGLE AIR BOTTLE STORAGE COMPARTMENT

A quantity of seven (7) air bottle compartments, 7.75" in diameter x 26.00" deep, will be provided on the left side, two single compartments between the tandem rear wheels, on the right side, two single compartments between the tandem rear wheels, on the left side rearward of the rear wheels, on the right side forward of the rear wheels and on the right side rearward of the rear wheels. A polished stainless steel door with a chrome plated flush lift & turn latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

EXTENSION LADDER

There will be one (1) 35', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladder(s) provided.

ADDED EXTENSION LADDER

There will be a 45', three (3) section, aluminum, Duo-Safety Series 1525-A extension ladder with poles provided.

EXTENSION LADDERS, AERIAL

There will be one (1) 28', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladder(s) provided.

ROOF LADDER

There will be two (2) 16' aluminum Duo-Safety Series 875-A roof ladder(s) provided.

ADDED ROOF LADDER

There will be two (2) 14' roof ladder, aluminum, Series 775-A, with a pair of 7/8" hooks at each end provided. The ladder will be 16.00" wide stored in the fly section.

FOLDING LADDER, AERIAL

There will be one (1) 10' aluminum, Duo-Safety, Series 585-A folding ladder(s) provided.

GROUND LADDER STORAGE

The ground ladders are stored within the torque box and are removable from the rear.

Ladders will be enclosed to prevent road dirt and debris from fouling or damaging the ladders.

The ladders rest in full length stainless steel slides and are arranged in such a manner that any one ladder can be removed without having to move or remove any other ladder.



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An AMDOR rollup door will be provided at the rear, double faced, aluminum construction, satin aluminum and manufactured by AMDOR manufacturing. The latching mechanism will consist of a full length lift bar lock with latches on the outer extrusion of the door frame.

A stainless plate with a two bend flange and a stainless steel hinge will be provided to secure the aerial ladder complement. The plate assembly will be mounted to the bottom of the entrance of the torque box ladder storage area.

When the plate is vertical, it will secure the ladders and prevent them from migrating to the rear of the apparatus. When the plate is down and not securing the ladders, the roll-up door can not close, which will activate the "Open Door Indicator Light" within the cab. The roll-up door together with hinge friction will secure the plate in place during driving operations.

A door guard will be provided to prevent tools inside the torque box from damaging the roll-up door.

LADDER STORAGE LIGHTING

There will be one (1) Truck-Lite Model 44308C 4.00" 12 volt DC white LED light used in place of the standard incandescent lights in the torque box ladder storage compartment.

LADDER STORAGE LIGHTING

There will be two (2) Truck Lite Model 44042C, 4.00" white LED lights with Model 40700, grommets used to illuminate the torque box ladder storage compartment. One (1) each side will be located on the side wall of the torque box near the ladder storage entry area.

The lights will be activated when the ladder storage compartment door is opened.

DURA-SURF MATERIAL

Black Dura-Surf friction reducing material will be added to the bottom of one (1) storage locations and located on the bottom of all the ladder troughs to prevent damage. The Dura-Surf material will be made to fit the storage area.

NESTED LADDER STORAGE

There will be nested ladders on the right side of the ladder storage compartment.

PIKE POLES

There will be two (2) 12' Duo Safety pike pole(s) with fiberglass handles provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.



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8' PIKE POLE

There will be two (2) 8' Duo Safety pike pole(s) with fiberglass handle provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

6' PIKE POLE

There will be two (2) 6' Duo Safety pike pole(s) with fiberglass handle provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

PIKE POLE 3 FT

There will be two (2) Fire Hooks Unlimited National Hook pike pole(s), with D-handle and fiberglass pole provided.

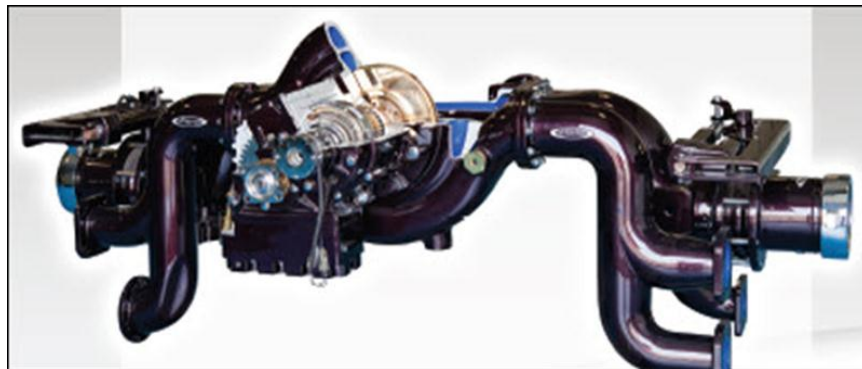
PIKE POLE STORAGE IN TORQUE BOX/LADDER STORAGE

There will be ABS tubing provided in the torque box/ladder storage area for a total of six (6) pike poles.

If the head of a pike pole can come into contact with a painted surface, a stainless steel scuffplate will be provided.

PUMP

Pump will be a Pierce, low profile, 1500 gpm single stage midship mounted centrifugal type, mounted below the cab. The pump will have a 15 percent reserve capacity to allow for extended time between pump rebuild. To ensure efficient pump/vehicle design the capacity to weight ratio will not be less than 1.5:1.



The pump casing will consist of three (3) discharge outlets, one (1) to each side in line with the impeller and one (1) to the rear. The pump casing will incorporate two (2) water strippers to maintain radial balance.

Pump will be the Class A type.



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Pump will be certified to deliver the percentage of rated discharge from draft at pressure indicated below:

- 100 percent of rated capacity at 150 psi net pump pressure
- 70 percent of rated capacity at 200 psi net pump pressure
- 50 percent of rated capacity at 250 psi net pump pressure

The pump will have the capacity to deliver the percentage of rated discharge from a pressurized source as indicated below:

- 135 percent of rated capacity at 100 psi net pump pressure from a 5 psi source

Pump body will be fine-grained gray iron. Pump will incorporate a heater/cooling jacket integral to the pump housing.

The impeller will be high strength vacuum cast bronze alloy accurately machine balanced and splined to a 10 spline stainless steel pump shaft for precision fit, exceptional durability, and efficiency. Double replaceable reverse flow labyrinth type bronze wear ring design will help to minimize end thrust. The impeller will be a twisted vane design to create higher lift.

The pump will include o-ring gaskets throughout the pump.

Deep groove radial type oversize ball bearings will be provided. The bearings will be protected at the openings from road dirt and water with an oil seal and a water slinger.

The pump will have a flat, patterned area on the top of the pump intake wye to allow standing for plumbing maintenance. The main inlet manifold will be 6.00" in diameter and will have a low profile design to facilitate low crosslays and high flows.

For ease of service, the pump housing, intake wye, impeller, mechanical seal, and gear case will be accessible from above the chassis frame by tilting the cab. The intake wyes will be removable without having to remove the main intake casting. Removal of the main inlet wyes will provide access to the impeller, mechanical seal, and wear ring.

The tank to pump line and the primary discharge line will be the only piping required to be removed for overhaul.

For ease of service and overhaul there will be no piping or manifolding located directly over the pump.



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PUMP MOUNTING

Pump will be mounted to the chassis frame rails directly below the crew cab, to minimize wheelbase and facilitate service, using rubber isolators in a modified V pattern that include two (2) central mounted isolators located between the frame rails, and one (1) on each side outside the frame rails. The mounting will allow chassis frame rails to flex independently without damage to the fire pump. Each isolator will be 2.55" in total outside diameter and will be rated at 490 lb. The pump will be completely accessible by tilting the cab with no piping located directly above the pump.

MECHANICAL SEALS

Silicon carbide mechanical seals will be provided. The seals will be spring loaded and self-adjusting. The seals will have a minimum thermal conductivity of 126 W/m*K to run cooler. Seals will have a minimum hardness of 2800 kg/mm² to be more resistant to wear, and have thermal expansion characteristics of no more than 4.0 X10⁻⁶mm/mm*K to be more resistant to thermal shock.

PUMP GEAR CASE

The pump gear case will be a pressure-lubricated to cool, lubricate, and filter the oil. The gear case will include an auxiliary PTO opening. The gear case will be constructed of lightweight aluminum, and impregnated with resin in accordance to MIL Spec MIL-I-17563. A dipstick, accessible by tilting the cab, will be provided for easy fluid level checks. A filter screen will be provided for long life.

The gear case will consist of two (2) gears to drive the pump impeller and one (1) for the auxiliary PTO.

The auxiliary PTO opening will provide for the addition of PTO driven accessories.

The pump will be driven through the rear engine power take-off and clutch. The rear engine power take-off drive will be live at all times to allow for pump and roll applications. Rear engine power take-off's allow for high horsepower and torque ratings needed for large pump applications, and is a proven drive system throughout the rugged construction industry.

CLUTCH

There will be a heavy-duty electric clutch mounted directly to the front of the pump to engage and disengage the pump without gear clash. The clutch will be a multiple disc design for maximum torque. The clutch will be fully self-adjusting to provide automatic wear compensation, and consistent torque throughout the life of the clutch. Positive engagement and disengagement will be provided through a high efficient and dependable magnetic system to assure superior performance. The clutch will have a 500 lb-ft rating. Clutch will be of a time-tested design used in critical military applications.



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PUMPING MODE

Stationary pumping mode will be accomplished by stopping the vehicle, setting the parking brake and engaging the water pump switch on the cab switch panel. The transmission will shift to "Neutral" range automatically when the parking brake is set. The "OK to Stationary Pump" indicator will also illuminate when the parking brake is set. If the vehicle is equipped with a foam system or CAFS system, this systems will be engaged from the cab switch panel as well.

PUMP SHIFT

Pump will be engaged in not more than two steps, by simply setting the parking brake, which will automatically put the transmission into neutral, and activating a rocker switch in the cab. Switches in the cab will also allow for water, foam, or CAFS if equipped, and activate the appropriate system to preset parameters. The engagement will provide simple two-step operation, enhance reliability, and completely eliminate gear clash. The shift will include the indicator lights as mandated by NFPA. A direct override switch will be located behind a door in the lower pump operator's panel. The switch will automatically disengage when the door is closed.

As the parking brake is applied, the pump panel throttle will be activated and deactivate the chassis foot throttle for stationary operation.

Pump and roll operation will be available by releasing the parking brake with the pump in the pumping mode. Releasing the parking brake will activate the chassis foot throttle, and deactivate the pump panel throttle. To protect from accidental pump overheating, the pump will automatically disengage when the truck transmission shifts into second gear.

TRANSMISSION LOCK UP

Transmission lock up is not required as transmission will automatically shift to neutral as soon as the parking brake is set.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. A water-to-coolant heat exchanger will be used.

INTAKE RELIEF VALVE

There will be One (1) Trident Air Max intake relief valve(s) installed on the suction side of the pump preset at 125 psig .

The relief valve will have a working range of 50 PSI to 350 PSI.

The outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and will have a "do not cap" warning tag.



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One adjustable air regulator and pressure indicating gauge will be located on a common bezel on the left side pump panel to control the intake valve(s).

PRESSURE CONTROLLER

A Pierce Pressure Governor will be provided. An electric pressure governor will be provided which is capable of automatically maintaining a desired preset discharge pressure in the water pump. When operating in the pressure control mode, the system will automatically maintain the discharge pressure set by the operator (within the discharge capabilities of the pump and water supply) regardless of flow, within the discharge capacities of the water pump and water supply.

A pressure transducer will be installed in the water discharge of the pump. The transducer continuously monitors pump pressure sending a signal to the Electronic Control Module (ECM).

The governor can be used in two (2) modes of operation, RPM mode and pressure modes.

In the RPM mode, the governor can be activated after vehicle parking brake has been set. When in this mode, the governor will maintain the set engine speed, regardless of engine load (within engine operation capabilities).

In the pressure mode, the governor system can only operate after the fire pump has been engaged and the vehicle parking brake has been set. When in the pressure mode, the pressure controller monitors the pump pressure and varies engine speed to maintain a precise pump pressure. The pressure controller will use a quicker reacting J1939 database for engine control.

A preset feature allows a predetermined pressure or rpm to be set.

A pump cavitation protection feature is also provided which will return the engine to idle should the pump cavitate. Cavitation is sensed by the combination of pump pressure below 30 psi and engine speed above 2000 rpm for more than five (5) seconds.

The throttle will be a vernier style control, with a large control knob for use with a gloved hand. A throttle ready light will be provided adjacent to the throttle control. A large 0.75" RPM display will be provided to be visible at a glance.

Check engine, and stop engine indicator lights will be provided for easy viewing.

Large 0.75" push buttons will be provided for menu, mode, preset, and silence selections.

The water tank level indicator will be incorporated in the pressure governor.

A fuel level indicator will be incorporated in the pressure controller.

A pump hour meter will be incorporated in the pressure controller.



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The pressure controller will incorporate monitoring for engine temperature, oil pressure, fuel level alarm, and voltage. Pump monitoring will include, pump gearcase temperature, error codes, diagnostic data, pump service reminders, and time stamped data logging, to allow for fast accurate trouble shooting. It will also notify the driver/engineer of any problems with the engine and the apparatus. Complete understandable messages will be provided in a 20-character display, providing for fewer abbreviations in the messages. An automatic dim feature will be included for night operations.

The pressure controller will include a USB port for easy software upgrades, which can be downloaded through a USB memory stick, eliminating the need for a laptop for software installations.

A complete interactive manual will be provided with the pressure controller.

PRIMING PUMP

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of NFPA 1901.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control will open the priming valve and start the pump primer.

PUMP MANUALS

There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals will be provided by the pump manufacturer in the form of two (2) electronic copies. Each manual will cover pump operation, maintenance, and parts.

PLUMBING, STAINLESS STEEL AND HOSE

All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

Plumbing manifold bodies will be ductile cast iron or stainless steel.

All piping lines are to be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame.



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All water carrying gauge lines will be of flexible polypropylene tubing.

All piping, hose and fittings will have a minimum of a 500 PSI hydrodynamic pressure rating.

MAIN PUMP INLETS

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

Main pump inlets will not be located on the main operator's panel and will maintain a low connection height by terminating below the top of the chassis frame rail.

MAIN PUMP INLET CAP

The main pump inlets will have National Standard Threads with a long handle chrome cap.

The cap will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.



INLET VALVES WITH INTAKE RELIEF VALVE

There will be Two (2) Akron Brass Revolution 7982 (30 degree swivel inlet) manually operated aluminum ball intake valve(s) provided right and left side .

The inlet connection will be 5.0" Storz with a cap and the outlet connection will be 6.0" FNST swivel long handle .

A 12.5" diameter handwheel will be included to operate valve open and close functions. A position indicator will be included to indicate position of the ball.

The ball intake valve will be equipped with an adjustable pressure relief valve. The relief valve will have a working range of 50 PSI to 250 PSI.

A 3/4" bleeder/drain valve will be provided on the ball intake valve to exhaust excess air or water from the valve.

The Intake Valve will be constructed of lightweight, corrosion-resistant, hard-anodized aluminum and stainless steel. To protect against corrosion, the casting will be coated with a powder coat finish and all components on the wet side of the valve will be constructed from stainless steel.



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VALVES

All ball valves will be Akron® Brass. The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves will have a **ten (10) year** warranty.

LEFT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

RIGHT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the right side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

The location of the valve for the one (1) inlet will be recessed behind the pump panel.

ANODE, INLET

A pair of sacrificial zinc anodes will be provided in the water pump inlets to protect the pump from corrosion.

INLET CONTROL

The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism will indicate the position of the valve.

INLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders will be routed below the chassis frame rails.

TANK TO PUMP

The booster tank will have a 3.00" outlet and be connected to the intake side of the pump with heavy duty 4.00" piping and a quarter turn 3.00" full flow line valve with the control located at the operator's panel. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.



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A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL

A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

LEFT SIDE DISCHARGE OUTLETS

There will be two (2) discharges with a 2.50" valves on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter. Discharges will be located below the cab, and will be no higher than the top of the chassis frame rail. Discharges will not be located on the pump operator's panel. Lever controls will be provided at the valve.

RIGHT SIDE DISCHARGE OUTLETS

There will be one (1) discharge outlet with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" MNST adapter. The discharge(s) will be located below the crew cab and will be no higher than the top of the chassis frame rail.

There will be Akron 9335 electric valve controller(s) provided on the pump operators panel. The electric control(s) must be of a true position feedback design, requiring no clutches in the motor or current limiting. The unit(s) must be completely sealed with momentary open, close as well and an optional one touch full open feature to operate the valve actuator. The controller(s) will provide position indication on a full color, backlit LCD display. They will have manual adjustment of the brightness as well as an auto dimming option.

In addition to valve position, each controller will include a pressure display.

LARGE DIAMETER DISCHARGE OUTLET

There will be a 4.00" discharge outlet with a 4.00" valve installed on the right side of the apparatus, terminating with 4.00" MNST threads. The discharge will be located below the crew cab and will be no higher than the top of the chassis frame rail.

There will be an Akron 9335 electric valve controller provided on the pump operators panel. The electric control must be of a true position feedback design, requiring no clutches in the motor or current limiting. The unit must be completely sealed with momentary open, close as well and an optional one touch full open feature to operate the valve actuator. The controller will provide position indication on a full color, backlit LCD display. It will have manual adjustment of the brightness as well as an auto dimming option.

In addition to valve position, the controller will include a pressure display.



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FRONT DISCHARGE OUTLET

There will be one (1) 2.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper.

Plumbing will consist of 2.50" piping and flexible hose with a 2.50" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 2.50" NST with 90 degree stainless steel swivel.

There will be automatic drains provided at all low points of the piping.

DISCHARGE CAPS/ INLET PLUGS

Chrome plated, rocker lug, caps with chain will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.

Chrome plated, rocker lug, plugs with chain will be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).

OUTLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

LARGE DIAMETER OUTLET CAP

The large diameter outlet will have a National Standard hose thread adapter with a 4.00" rocker lug chrome plated cap and chain.

The cap will be the Pierce VLH, which incorporates a patent pending thread design to automatically relieve stored pressure in the line when disconnected.



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ADAPTERS

There will be one (1) adapter with 5.00" Storz x 2.50" MNST threads and a 2.50" hard coat cap installed on larger diameter.

DISCHARGE OUTLET CONTROLS

The right side discharges will incorporate a quarter-turn ball valve and be controlled by Akron 9335 electric valve controllers provided on the pump operators panel. The electric controls must be of a true position feedback design, requiring no clutches in the motor or current limiting. The units must be completely sealed with momentary open, close as well and an optional one touch full open feature to operate their corresponding valve actuator. The controllers will provide position indication on a full color, backlit LCD display. They will have manual adjustment of the brightness as well as an auto dimming option. In addition to the valve controls, the electric valve controllers will include a pressure display

All other outlets will have manual swing handles that operate in a vertical up and down motion. These handles will be able to lock in place to prevent valve creep under pressure.

AERIAL OUTLET

The aerial waterway will be plumbed from the pump to the water tower line with 4.00" pipe and a 4.00" valve. The control for the waterway valve will be located at the pump operator's panel.

An indicator will be provided to show when the valve is in the open or closed position.

CROSSLAY HOSE BEDS

Two (2) crosslays with 1.50" outlets will be provided. Each bed to be capable of carrying 250' of 1.75" hose, each double jacketed hose and will be plumbed with 2.00" i.d. schedule 10 304L welded or formed stainless steel pipe and gated with a 2.00" quarter turn ball valve. Crosslays will be low mounted with the bottom of both crosslay trays no more than 14.00" above the frame rails for simple, safe reloading and deployment. The hose beds will be full width of the body compartments.

Outlets to be equipped with a 1.50" National Standard hose thread 90-degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls will be at the pump operator's panel.

A removable tray will be provided for the crosslay hose bed. The crosslay tray will be constructed of black poly to provide a lightweight sturdy tray. Two (2) hand holes will be in the floor and additional hand holes will be provided in the sides for easy removal and installation from the compartment. The floor of the trays will be perforated to allow for drainage and hose drying. Trays will be held in place by a mechanical spring loaded stainless steel latch that automatically deploys upon loading the trays to hold the trays in place during transit.



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CROSSLAY HOSE BED, 2.50"

One (1) crosslay with a 2.50" outlet will be provided. The bed to be capable of carrying 200' of 2.5" hose and will be plumbed with 2.50" i.d. schedule 10 304L welded or formed stainless steel pipe and gated with a 2.50" quarter turn ball valve.

The outlet to be equipped with a 2.50" National Standard hose thread 90 degree swivel located above the hose bed so that hose may be removed from either side of apparatus.

The crosslay will be mounted above the lower 1.5" crosslays. The crosslay controls will be at the pump operator's panel.

A removable tray will be provided for the crosslay hosebed. The crosslay tray shall be as wide as the crosslay opening will allow and of black poly to provide a lightweight sturdy tray. Two (2) hand holes will be in the floor and additional hand holes will be provided in the sides for easy removal and installation from the compartment. The floor of the trays will be perforated to allow for drainage and hose drying. Tray will be held in place by a mechanical spring loaded stainless steel latch that automatically deploys upon loading the tray to hold the trays in place during transit.

CROSSLAY/DEADLAY HOSE RESTRAINT

A black 2.00" nylon webbing design with 2.00" box pattern will be provided across each end of three (3) crosslay/deadlay(s) to secure the hose during travel. The webbing will be permanently attached at the bottom of the flaps over the crosslay/deadlay bed. One (1) seat belt buckle will connect the flap at the center of the crosslay/deadlay bed at the top. The flaps will hook onto footman loops at the bottom of the bed. An orange pull strap will be attached to the seat belt buckle to open the hose restraint.

CROSSLAY/EQUIPMENT MODULE WITH BOOM SUPPORT COMPARTMENT

The forward body module containing the crosslays, the boom support and transverse storage area will be enclosed. The enclosure will be provided on both sides of the body, full width of the body compartmentation.

The enclosure will be fabricated from aluminum and painted to match the front of the body. The enclosure will be bolted on construction.

Rollup doors will be provided on both sides for access.

ROLLUP DOOR

Each Gortite rollup door will be double faced aluminum construction and painted one (1) color to match the lower portion of the body.



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Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from plus 300 to minus 40 degrees Fahrenheit.

A polished stainless steel lift bar to be provided for each roll-up door. Lift bar will be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Doors will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surfaces will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

The header for the rollup door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

The enclosure will have a drip pan below the roll of the door.

SPEEDLAY/ENCLOSURE

The 2.50" speedlay plumbing will be capped off. The 2.50" speedlay poly tray will be shipped loose. The upper speedlay/stokes basket enclosure will be interchangeable at the discretion of the customer.

STOKES BASKET STORAGE

Mounting will be provided for one (1) stokes basket located in the upper crosslay area. The stokes basket will be 84.50"L x 23"W x 7.75"THK. The equipment will be enclosed with each end open so equipment can be removed from either side of the truck.

FOAM SYSTEM

A foam system will not be required on this apparatus.



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PUC MODULE

The pump module will be separate from the hose body and compartments so that each may flex independently of the other. It will be a fabricated assembly of aluminum tubing, angles and channels which supports both the plumbing and the side running boards.

The pump module will be mounted on the chassis frame rails with standard body angles in four places to allow for chassis frame twist.

Pump module, plumbing and gauge panels will be removable from the chassis in a single assembly.

PUMP CONTROL PANELS (LEFT SIDE CONTROL)

Pump controls and gauges will be located midship at the left side of the apparatus and properly identified.

The main pump operator's control panel will be completely enclosed and located in the forward section of the body compartment. There will be a roll up door to protect against road debris and weather elements. This roll-up door compartment will include a drip pan below the roll of the door. The pump operator's panels will be no more than 31.00" wide, and made in four (4) sections with the center section easily removable with simple hand tools. For the safety of the pump operator, there will be no discharge outlets or pump inlets located on the main pump operators panel.



Layout of the pump control panel will be ergonomically efficient and systematically organized. The upper section will contain the master gauges. This section will be angled down for easy visibility. The center section will contain the pump controls aligned in two horizontal rows. The pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable) will be located on or adjacent to the center panel, on the side walls for easy operation and visibility. The lower section will contain the outlet drains.

Manual controls will be easy moving 8" long lever style controls that operate in a vertical, up and down swing motion. These handles will have a 2.25" diameter knob and be able to lock in place to prevent valve creep under any pressure. Bright finish bezels will encompass the opening, be securely mounted to the pump operator's panel, and will incorporate the discharge gauge bezel. Bezels will be bolted to the panel for easy removal and gauge service. The driver's side discharges will be controlled directly at the valve. There will be no push-pull style control handles.



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Identification tags for the discharge controls will be recessed within the same bezel. The discharge identification tags will be color coded, with each discharge having its own unique color.

All remaining identification tags will be mounted on the pump panel in chrome-plated bezels.

All discharge outlets will be color coded and labeled to correspond with the discharge identification tag.

The pump panels for the discharge and intake ports will be located ahead of the pump module with no side discharge or intake higher than the frame rail. The pump panels will be easily removable with simple hand tools.

A recessed cargo area will be provided at the front of the body, ahead of the water tank above the plumbing.

PASSENGER SIDE PUC MODULE COMPARTMENT

A full height compartment with a roll-up door ahead of the front stabilizer will be provided, as convenient large storage compartment for often used items for the crew. The interior dimensions of this compartment will be 30.25" wide x 52.00" high x 25.13" deep. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 28.00" wide x 52.00 high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

This roll-up door compartment will include a drip pan below the roll of the door.

PUMP PANEL CONFIGURATION

The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

PUMP OPERATOR'S PLATFORM

A pull out, flip down platform will be provided at the pump operator's control panel.

The front edge and the top surface of the platform will be made of DA finished aluminum with a Morton Cass insert.

The platform will be approximately 13.75" deep when in the stowed position and approximately 22.00" deep when extended. The platform will be as wide as possible. The platform will lock in the retracted and the extended position.



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An enclosure will be provided for the slide-out platform to prevent accumulations of road dirt. This enclosure will be aluminum painted job color.

PUMP OPERATOR'S PLATFORM PERIMETER LIGHT

There will be an Amdor, Model AY-LB-12HW020, 350 lumens each, 20.00" white 12 volt DC LED strip light provided to illuminate the ground area.

PUMP AND GAUGE PANEL

The pump operator's panel and gauge panels will be constructed of stainless steel with a brushed finish.

The side control panels will be constructed of stainless steel with a brushed finish for durability and ease of maintenance.

PUMP AND PLUMBING ACCESS

Simple access to the plumbing will be provided through the front of the body area by raising the cab for complete plumbing service and valve maintenance. Access to valves will not require removal of operator panels or pump panels. Access for rebuilding of the pump will not require removal of more than the tank to pump line and a single discharge line. This access will allow for fast, easy valve or pump rebuilding, making for reduced out of service times. Steps will be provided for access to the top of the pump.



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Access to the pump will be provided by raising the cab. The pump will be positioned such that all maintenance and overhaul work can be performed above the frame and under the tilted cab. The service and overhaul work on the pump will not require the removal of operator panels or pump panels. Complete pump casing and gear case removal will require no more than removal of the intake and discharge manifolds, driveline, coolers and a single discharge line. The pump case and gear case will be able to be removed by lifting upward without interference from piping and be removable in less than 3 hours.

PUMP COMPARTMENT LIGHT

A pump compartment light will be provided inside the plumbing area.

A .125" weep hole will be provided in each light lens, preventing moisture retention.

Engine monitoring graduated LED indicators will be incorporated with the pressure controller.

VACUUM AND PRESSURE GAUGES

The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated ©.



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The gauges will be a minimum of 4.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and non-corrosive polished stainless steel or brass plugs. They will be marked with a label.

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges will be Class 1© interlube filled.

They will be a minimum of 2.00" in diameter and have white faces with black lettering.

Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

Gauges will have a pressure range of 30"-0-400#.

The individual pressure gauge will be installed as close to the outlet control as practical.

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

WATER LEVEL GAUGE

An electric water level gauge will be incorporated in the pressure controller that registers water level by means of nine (9) LEDs. They will be at 1/8 level increments with a tank empty LED. The LEDs will be a bright type that is readable in sunlight, and have a full 180-degree of clear viewing.

To further alert the pump operator, the gauge will have a warning flash when the tank volume is less than 25 percent, and will have down chasing LEDs when the tank is almost empty.

The level measurement will be ascertained by sensing the head pressure of the fluid in the tank or cell.



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SIDE CONTROL PUMP OPERATOR'S/PUMP PANEL LIGHTING

Illumination will be provided for controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it. External illumination will be a minimum of five (5) foot-candles on the face of the device. Internal illumination will be a minimum of four (4) footlamberts.

The pump panels will be illuminated by four (4) Truck-Lite, Model 6060C white LED lights installed on the back of the cab, two (2) on the driver's side and two (2) on the passenger's side.

The pump operator's panel will utilize the same LED strip lighting at the forward doorframe as all other compartment lighting.

There will be a small white LED pump engaged indicator light installed overhead.

AIR HORN SYSTEM

Two (2) Hadley round air horns with 6.00" bell will be recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

Air Horn Location

The air horns will be located on each side of the bumper, just outside of the frame rails.

AIR HORN CONTROL

The air horns will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

AUXILIARY MECHANICAL SIREN

A Federal Q2B® siren will be furnished. A siren brake button will be installed on the switch panel.

The control solenoid will be powered up after the emergency master switch is activated.

The mechanical siren will be mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

The mechanical siren will be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

GROUND STRAP FROM Q2B TO GROUND STUD

A ground wire will be added to the Q2B siren. The ground wire will run from the siren motor to the ground stud below the bumper deckplate.



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FRONT ZONE UPPER WARNING LIGHTS

There will be two (2) 21.50" Whelen Freedom IV lightbars mounted on the cab roof, one (1) on each side above the driver's and passenger's door at a 30 degree outward angle from the front of the cab.

The driver's side lightbar will include the following:

- One (1) red flashing LED module in the outside end position.
- One (1) red flashing LED module in the outside front corner position.
- One (1) white flashing LED module in the outside front position.
- One (1) red flashing LED module in the inside front position.
- One (1) red flashing LED module in the inside front corner position.

The passenger's side lightbar will include the following:

- One (1) red flashing LED module in the inside front corner position.
- One (1) red flashing LED module in the inside front position.
- One (1) white flashing LED module in the outside front position.
- One (1) red flashing LED module in the outside front corner position.
- One (1) red flashing LED module in the outside end position.

There will be clear lenses included on the lightbar.

There will be a switch in the cab on the switch panel to control the lightbars.

The white LED's will be disabled when the parking brake is applied.

The two (2) red flashing LED modules in the inside front and the two red flashing LED modules in the inside front corner positions may be load managed when the parking brake is applied.

TRAFFIC LIGHT CONTROLLER

There will be a GTT, Model 792* strobe Opticom traffic light controller with national standard high priority remote mounted on the front edge of the cab driver side cab roof, just to the outside of the notch.

The Opticom traffic light controller will be activated by a cab switch with emergency master control.

The Opticom traffic light controller will have no momentary activation switch.

The Opticom traffic light controller will be disabled when the parking brake is applied.



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CAB FACE WARNING LIGHTS

There will be four (4) Whelen®, Model M6*, LED flashing warning lights installed on the cab face, above the headlights, mounted in a common bezel.

- The driver's side front outside warning light to be red
- The driver's side front inside warning light to be white
- The passenger's side front inside warning light to be white
- The passenger's side front outside warning light to be red

All four (4) lights will include a colored lens that is the same color of the LED's.

There will be a switch located in the cab, on the switch panel, to control the four (4) lights.

The inside lights may be load managed if colored or disabled if white, when the parking brake is set.

SIDE ZONE LOWER LIGHTING

There will be six (6) Whelen®, Model M6**, 4.31" high x 6.75" long x 1.37" deep flashing LED warning lights with chrome trim installed per the following:

- Two (2) lights located, one (1) each side on the bumper extension. The driver's side, side front light to include red warning LEDs and the passenger's side, side front light to include red warning LEDs.
- Two (2) lights located, one (1) each side above the front wheels. The driver's side, side middle light to include blue warning LEDs and the passenger's side, side middle light to include blue warning LEDs.
- Two (2) lights located, one (1) each side located between the tandems. The driver's side, side rear light to include red warning LEDs and the passenger's side, side rear light to include red warning LEDs.
- The warning light lens colors to be the same as the LEDs.

There will be a switch in the cab on the switch panel to control the lights.

SIDE WARNING LIGHTS

There will be one (1) pair of Whelen, Model M6* LED flashing lights provided.

The lights will be located on the cab corner each side and will be activated with the side warning switch.

The color of the lights will be red Super LED/red lens.

The lights will be mounted on a 45 degree angled forward polished stainless steel bezels.



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Any white light will terminate when the parking brake is applied.

REAR ZONE LOWER LIGHTING

Two (2) Whelen, Model M6* LED flashing warning lights with bezels will be located at the rear of the apparatus.

The driver's side rear light to be red.

The passenger's side rear light to be red.

Both lights will include a lens that is the same color as the LED's.

There will be a switch located in the cab on the switch panel to control the lights.

REAR WARNING LIGHTS

There will be one (1) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning light(s) with chrome trim provided at the rear of the apparatus, above taillights right side.

The light(s) to include blue flashing LEDs. The warning light lens colors to be the same as the LEDs.

These light(s) will be controlled with the rear upper warning switch.

The light(s) may be load managed when the parking brake is applied.

REAR WARNING LIGHTS

There will be one (1) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning light(s) with chrome trim provided at the rear of the apparatus, above taillights left side.

The light(s) to include red flashing LEDs. The warning light lens colors to be the same as the LEDs.

These light(s) will be controlled with the rear upper warning switch.

The light(s) may be load managed when the parking brake is applied.

REAR OF HOSEBED WARNING LIGHTS

There will be two (2) Whelen, Model B6M7**1P Super LED beacon with lower LED flashing warning lights provided at the rear of the truck, one (1) each side.

Each light will include a Super LED flashing beacon and a Whelen, Model M7* LED flashing light, mounted in a polished aluminum housing.



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The beacons will have red LEDs and be provided with both domes red.

The color of the Whelen, Model M7* LED flashing lights will be amber and include a lens that is the same color as the LED's .

A switch will be provided in the cab, on the switch panel to control the beacons. The lower Whelen, M7* LED lights will be activated with the rear upper warning switch.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen®, Model TAM85, 46.00" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen, Model TACTL5, control head will be included with this installation.

The controller will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be mounted on top of the body below the turntable with a treadplate box at the rear of the apparatus.

The traffic directing light control head will be located in the driver side overhead switch panel in the center panel position.

ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT

The following guidelines will apply to the 120/240 VAC system installation:

General

Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

Grounding

Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.



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An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This conductor will have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.

All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.

Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the following information:

- Rated voltage(s) and type (ac or dc)
- Phase
- Rated frequency
- Rated amperage
- Continuous rated watts
- Power source engine speed

Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.



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Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144.00" (3658 mm) in length.

For fixed power supplies, all conductors in the power supply assembly will be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius).

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device will be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

Wiring Methods

Fixed wiring systems will be limited to the following:

- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)
- or
- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

Electrical cord or conduit will not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring will be run as follows.

- Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping
- Separated from fuel lines by a minimum of 6.00" (152 mm) distance

Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.

Wiring Identification

All line voltage conductors located in the main panel board will be individually and permanently identified. The identification will reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends will be labeled showing function and wire size.



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Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, will be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location will be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (762 mm) from the ground.

The face of any wet location receptacle will be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle will be installed in a face up position.

Dry Locations

All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30.00" (762 mm) above the interior floor height.

All receptacles will be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they will be so marked.

Listing

All receptacles and electrical inlet devices will be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages will be rated for the appropriate service.

Electrical System Testing

The wiring and associated equipment will be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test will be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test will be conducted after all body work has been completed.

Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

Operational Test per Current NFPA 1901 Standard

The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by an independent third-party certification organization.



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The prime mover will be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

The power source will be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard will be applied to the low voltage electrical system during the operational test.

GENERATOR

The apparatus will be equipped with a complete AC (alternating current) electrical power system. The generator will be a Harrison Model 6.0MAS-16R/D-11011/15/1, 6,000 watt hydraulic driven unit.

The generator will be driven by a transmission power take off unit, through a hydraulic pump and motor.

The hydraulic engagement supply will be operational only after the chassis parking brake is engaged and transmission is in neutral.

An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

Generator Instruments and Controls

To properly monitor the generator performance a digital meter panel will be furnished and mounted near the circuit breaker panel.

GENERATOR LOCATION

The generator will be mounted in the cargo area at the front of the body in center. The flooring in this area will be either reinforced or constructed, in such a manner, that it will handle the additional weight of the generator.

GENERATOR START

There will be a switch provided on the cab instrument panel to engage the generator.

CIRCUIT BREAKER PANEL

The circuit breaker panel will be located high on the back wall of compartment LS6 to the left side.



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DIGITAL METER PANEL

The generator meter panel will be installed D4 body compartment on forward wall - near breaker panel in place of the standard location. The digital meter panel will be on anytime the generator is running (no green indicator light is required).

BRACKETS, 120/240 VOLT LIGHT

There will be two (2) aluminum treadplate bracket(s) installed each side of rear body for the recessed flood lights. The bracket(s) will have all wiring totally enclosed.

120 VOLT LIGHTING

There will be One (1) 120 volt LED combination spot/flood light(s) installed in a semi-recessed chrome housing(s) located passenger side body just forward of turn table.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the AC circuit breaker as well as the following:

- no switch location
- no additional switch location
- no additional switch location
- no additional switch location

120 VOLT LIGHTING

There will be One (1) Whelen, Model PCP2AC, 120 volt LED combination spot/flood light(s) installed in a Whelen, Model PBA203, semi-recessed chrome housing(s) located driver side body just forward of turn table.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the AC circuit breaker as well as the following:

- no switch location
- no additional switch location
- no additional switch location
- no additional switch location

ELECTRIC CORD REEL

Furnished with the 120 volt AC electrical system will be a Hannay, Series 1600, cord reel. The reel will be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position.



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The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer.

A Nylatron guide to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length.

A total of one (1) cord reel will be provided one (1) forward in the passenger's side hatch compartment.

The cord reel will be configured with three (3) conductors.

CORD

Provided for electric distribution will be one (1) length installed on the reel of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt jacketed SOOW cord. No connector will be installed on the end of the cord.

PORTABLE JUNCTION BOX

There will be one (1) Akron EJBX electric junction box(es) provided.

There will be a cable strain relief and direct connection, no plug provided for each box.

Each box will be provided with the following:

- four (4) 15/20 amp 120 volt AC duplex straight blade receptacles with flip up covers
- a 120 volt AC light inside the box

REEL FEED THROUGH HATCH FLOOR

A Nylatron guide will be provided through the floor of the hatch compartment, into the compartment below, to assist with the pay out of the cord. A flange will be provided around the guide to assist in keeping water from running into the compartment. A ball stop will be provided on the cord to stop the cord at the roller assembly.

A total of one (1) will be installed.

POWER OUTLET STRIP

There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided along the back of the engine dog house tied up loose (see photo).

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:



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- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source

POWER OUTLET STRIP

There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided the receptacle is to be located on the back/tank wall of compartment P6 - see photo.

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source

120 VOLT RECEPTACLE

There will be five (5), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with exterior flip up cover(s), installed one on each side of the extended crew cab, just above the compartment, one each side at the forward portion of each body fender, and one at the rear of the body on passenger side. The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the on board generator.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency
- Power Source



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FOUR (4)-SECTION 107 FOOT AERIAL LADDER

CONSTRUCTION STANDARDS

The ladder will be constructed to meet all of the requirements as described in the current NFPA 1901 standards.

The aerial device will be a true ladder type device; therefore ladders attached to booms will not be considered.

These capabilities will be established in an unsupported configuration.

All structural load supporting elements of the aerial device that are made of a ductile material will have a design stress of not more than 50% of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the current NFPA 1901 standard.

All structural load supporting elements of the aerial device that are made of non-ductile material will have a design stress of not more than 20% of the minimum ultimate strength of the material, based on the combination of the rated capacity and the dead load. This 5:1 safety factor meets the current NFPA 1901 standard.

Wire ropes and attaching systems used to extend and retract the fly sections will have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope will remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used will be 1:12. Wire ropes will be constructed of seven (7) strands over an inner wire core for increased flexibility. The wire rope will be galvanized to reduce corrosion.

The aerial base pivot bearings will be maintenance free type bearings and require no external lubrication.

The aerial device will be capable of sustaining a static load one and one-half times its rated tip load capacity (live load) in every position in which the aerial device can be placed when the vehicle is on a firm level surface.

The aerial device will be capable of sustaining a static load one and one-third times its rated tip load capacity (live load) in every position the aerial device can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.

With the aerial device out of the cradle and in the fully extended position at zero degrees elevation, a test load will be applied in a horizontal direction normal to the centerline of the



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ladder. The turntable will not rotate and the ladder will not deflect beyond what the product specification allows.

All welding of aerial components, including the aerial ladder sections, turntable, pedestal, and outriggers, will be in compliance with the American Welding Society standards. All welding personnel will be certified, as qualified under AWS welding codes.

The aerial device will be capable of operating in conditions of wind up to 50 mph and icing conditions of up to a .25" coating over the aerial structure.

All of the design criteria must be supported by the following test data:

- Strain gage testing of the complete aerial device
- Analysis of deflection data taken while the aerial device was under test load

The following standards for materials are to be used in the design of the aerial device:

- Materials are to be certified by the mill that manufactured the material
- Material testing that is performed after the mill test will be for verification only and not with the intent of changing the classification
- All welded structural components for the ladder will be traceable to their mill lots.

LADDER CONSTRUCTION

The ladder is comprised of four (4) sections.

The ladder will have the capability to support a minimum of 750 pounds at the tip in the unsupported configuration, based upon 360 degree rotation, up to full extension and from -10 degrees to +77 degrees.

The ladder (handrails, baserails, trusses, K-braces and rungs) will be constructed of high strength low alloy steel, minimum 100,000 pounds per square inch yield, with full traceability on all structural members.

Each section will be trussed diagonally, vertically and horizontally using welded steel tubing.

All ladder rungs are round and welded to each section utilizing "K" bracing for lateral and torsional rigidity.

The inside width dimensions of the ladder will be:

- Base Section 41.87"



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- Lower Mid Section 34.88"
- Upper Mid Section 27.87"
- Fly Section 21.63"

The height of the handrails above the centerline of the rungs will be:

- Base Section 26.28"
- Lower Mid Section 22.68"
- Upper Mid Section 20.06"
- Fly Section 17.32"

The ladder will be designed to provide continuous egress for firefighters and civilians from an elevated position to the ground.

The egress section will be designed to maintain the rated load of the aerial device. It will be bolted on for easy replacement. There will be a tow eye welded on to each side of the egress.

VERTICAL HEIGHT

The ladder will extend to a minimum height of 107' above the ground at full extension and elevation. The measurement of height will be consistent with NFPA standards.

HORIZONTAL REACH

The rated horizontal reach will be 100'. The measurement of horizontal reach will be consistent with NFPA standards.

TURNTABLE

The upper turntable assembly will connect the aerial ladder to the turntable bearing. The steel structure will have a mounting position for the aerial elevation cylinders, ladder connecting pins, and upper turntable operator's position.

The turntable will be a 0.375" thick steel deck, coated with a non-skid, chemical resistant material in the walking areas. The stepping surfaces will meet the skid-resistance requirements of the current NFPA 1901 standard.

The turntable handrails will be a minimum 42.00" high and will not increase the overall travel height of the vehicle. The handrails will be constructed from aluminum and have a slip resistant knurled surface. The turntable vertical handrail spacing will be designed with a 44.00" wide x 27.00" high opening to allow for equipment to pass through from the ground to the aerial ladder. The opening will be located at the center, rear of the turntable.



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ELEVATION SYSTEM

Dual 5.50" diameter elevating cylinders will be mounted on the underside of the base section of the ladder, one (1) on each side. One (1) 2.25" diameter stainless steel pin will fasten each cylinder to the ladder and one (1) 2.50" diameter stainless steel pin will fasten each cylinder to the turntable. The pins will have 125,000 psi minimum yield strength and will be secured with 0.50" Grade 8 bolts with castle nut and cotter pin. The bolts are to ensure that the pins do not walk out of the mounting brackets on the turntable and base section.

The elevating cylinders will be mounted utilizing maintenance-free spherical bearings on both ends of the cylinders. The aerial base pivot bearings will be maintenance-free type bearings with no external lubrication required. The cylinders will function only to elevate the ladder and not as a structural member to stabilize the ladder side movement. The elevating cylinders will be provided with pilot-operated check valves on the barrel and rod side of the piston to prevent movement of the ladder in case of a loss of hydraulic pressure.

The operation envelope will be 10 degrees below horizontal to 77 degrees above horizontal.

The elevation system will be designed following NFPA standards. The elevation hydraulic cylinders will incorporate cushions on the upper limit of travel.

The lift cylinders will be equipped with integral holding valves located in the cylinder to prevent the unit from descending should the charged lines be severed, at any point within the hydraulic system and to maintain the ladder in the bedded position during road travel. The integral holding valves will NOT be located in the transfer tubes.

The elevation system will be controlled by the microprocessor. Linear transducers will measure the extension of the elevation cylinder. The microprocessor will provide the following features:

- Collision avoidance of the elevation system to prevent accidental body damage
- Automatic deceleration when the aerial device is lowered into the cradle
- Automatic deceleration at the end of stroke, in maximum raise and lower positions
- Deceleration of the aerial device at the limits of travel.

EXTENSION/RETRACTION SYSTEM

A hydraulically powered, extension and retraction system will be provided through dual hydraulic cylinders and wire ropes. Each set will be capable of operating the ladder in the event of a failure, of the other. The extension cylinder rod will be chrome plated to provide smooth operation of the aerial device and reduce seal wear. The extension/retraction cylinders will be equipped, with integral holding valves, to prevent the unit from retracting should the charged line



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be severed, at any point within the hydraulic system. The integral holding valves will NOT be located in the transfer tubes.

Wire ropes and attaching systems used to extend and retract the fly sections will have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope will remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used will be 1:12. Wire ropes will be constructed of seven (7) strands over an inner wire for increased flexibility. The wire rope will be galvanized to reduce corrosion.

The extension/retraction system will be controlled by the microprocessor. Linear transducers will measure the ladder extension. The microprocessor will provide the following features:

- Automatic deceleration at the end of stroke, in maximum extend and retract positions

All sheaves will require lubrication. They will have bronze bushings and grease zerks.

MANUAL OVERRIDE CONTROLS

Manual override controls will be provided for all aerial and stabilizer functions.

LADDER SLIDE MECHANISM

UHMW polyethylene wear pads will be used between the telescoping ladder sections, to provide greater bearing surface area for load transfer. Adjustable slide pads will be used to control side play between the ladder sections.

ROTATION SYSTEM

The aerial will be supplied with a powered rotation system as outlined in NFPA standards. The hydraulic rotation motor will provide continuous rotation under all rated conditions and be supplied with a brake to prevent unintentional rotation. One (1) hydraulically driven, planetary gear box with drive speed reducers will be used to provide infinite and minute rotation control throughout the entire rotational travel. One (1) spring applied, hydraulically released disc type swing brake will be furnished to provide positive braking of the turntable assembly. Provisions will be made for emergency operation of the rotation system should complete loss of normal hydraulic power occur. The hydraulic system will be equipped with pressure relief valves which will limit the rotational torque to a nondestructive power. The gearbox will have a minimum continuous torque rating of 80,000 in. lbs. and a minimum intermittent rating of 160,000 in. lbs. The turntable bearing, ring gear teeth, pinion gear, planetary gearbox, and output shaft will be certified by the manufacturer of the components for the application.

The rotation system will be controlled by the microprocessor. The microprocessor will provide the following features:



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- Collision avoidance to prevent accidental body damage
- Prevent the aerial from being rotated into an unstable condition.

ROTATION INTERLOCK

The microprocessor will be used to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed (short-jacked). The microprocessor will allow full and unrestricted use of the aerial, in the 180 degree area, on the side(s) where the stabilizers have been fully deployed. The system will also have a manual override, to comply with NFPA 1901. SYSTEMS THAT PERMIT THE AERIAL TO ROTATE TO THE "SHORT JACK" SIDE, WITHOUT AUTOMATICALLY STOPPING THE ROTATION AND/OR WITHOUT ACTUATION OF THE "MANUAL OVERRIDE", will NOT BE ACCEPTED. SYSTEMS THAT ONLY INCLUDE AN ALARM ARE NOT CONSIDERED AN INTERLOCK AND will NOT BE ACCEPTED.

LADDER CRADLE INTERLOCK SYSTEM

A ladder cradle interlock system will be provided through the microprocessor to prevent the lifting of the aerial device from the nested position until the operator places all the stabilizers in a load supporting configuration. A switch will be installed at the boom support to prevent operation of the stabilizers once the aerial has been elevated from the nested position..

AERIAL TORQUE BOX/PEDESTAL

The pedestal assembly will be a welded assembly made of high strength 0.25" plate. The vertical member will be a 0.375" reinforced wall cylinder with a 28.00" outside diameter and will connect the rotation bearing mounting plate to the lower substructure.

The pedestal assembly will be bolted to the chassis frame with 0.88" diameter Grade 8 bolts, and will be utilized to mount the outrigger jacks and reservoir for the aerial hydraulic system.

There will be a 5/8" gap between the torque box and the frame rails to promote drying of the surfaces and reduce the effect of corrosion.

LOAD CAPACITIES

The following load capacities will be established with the stabilizers at full horizontal extension and placed in the down position to level the truck and to relieve the weight from the tires and axles. Capacities will be based upon full extension and 360 degree rotation.

A load chart, visible at the operator's station, will be provided. The load chart will show the recommended safe load at any condition of the aerial device's elevation and extension.

50 MPH WIND CONDITIONS/WATERWAY DRY

Degrees of	-10 to	10 to	20 to	30 to	40 to	50 to	60 to	70 to
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Elevation	9	19	29	39	49	59	69	77
Egress	750	750	750	750	750	750	750	750
Fly	-	-	-	-	-	250	500	750
Upper Mid	-	-	-	-	250	500	1000	1000
Lower Mid	-	-	-	-	500	750	1000	1000
Base	-	-	-	500	500	1000	1000	1000

50 MPH WIND CONDITIONS/WATERWAY CHARGED

Degrees of Elevation	-10 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 77
Egress	500	500	500	500	500	500	500	500
Fly	-	-	-	-	-	250	500	500
Upper Mid	-	-	-	-	250	500	750	1000
Lower Mid	-	-	-	250	500	750	1000	1000
Base	-	-	250	500	750	1000	1000	1000

Reduced loads at the tip can be redistributed in 250 lb. increments to the fly, mid, or base sections as needed.

The tip capacity will be reduced to zero when flowing water with the nozzle above the waterway centerline.

Side to side monitor travel will be reduced with a 50MPH wind rating on the device.

BOOM SUPPORT

A heavy-duty boom support will be provided for support of the ladder in the travel position. On the base section of the ladder, a stainless steel scuffplate will be provided where the ladder comes into contact with the boom support.

The boom support will be located just to the rear of the chassis cab.

AERIAL BOOM SUPPORT LIGHT

There will be one (1) Amdor®, Model AY-LB-12HW012, 190 lumen, 12" long, white LED strip light mounted on the boom support cradle. This light will be activated when the aerial master switch is activated.



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BODY STRUCTURE DIRECTLY BEHIND THE CAB

Treadplate body structure will be provided on each side of the apparatus directly behind the cab.

AERIAL BOOM PANEL

There will be one boom panel provided on each side of the aerial ladder base section. The boom panel will be painted #20 white.

The boom panels will be designed so no mounting bolts are in the face of the panel. This will keep the lettering surface free of holes.

EXTENSION INDICATOR

Extension markings and corresponding numerical indicators will be provided along each inside and outside top rail of the base section of the aerial every 10'. They will indicate various positions of extension up to full. Markings and indicators will be clearly visible to the console operator. To aid in visibility during hours of darkness, the markings and numerical indicators will be black reflective material.

FOLDING STEPS

One (1) set of folding steps will be provided at the tip of the ladder. An additional set of folding steps will be provided at the base of the fly section. The steps will be bright finished, non-skid with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours.

AERIAL DEVICE RUNG COVERS

Each rung will be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, no-slip coating.

The rung covers will be glued to each rung, and will be easily replaceable should the rung cover become damaged.

The center portion of each rung cover will be black and the outside 2.00" edge at each side will be safety yellow.

Under no circumstances will the rung covers be fastened to the rungs using screws or rivets.

The rung covers will have a 10-year, limited warranty.

LIMITED RETRACTION

The aerial device will have limited retraction.

LADDER STORAGE MOUNTING BRACKETS

There will be brackets that are painted to match the aerial device provided near the end of the fly section of the aerial for mounting a roof ladder.



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The mounting brackets will accommodate a 14' Duo-Safety 775-A, 16.00" wide roof ladder as determined by the type of aerial device and the available space.

LIGHTS FOR TURNTABLE WALKWAY

There will be white LED lights provided at the aerial turntable. The lights will be located to illuminate the entire walking surface of the turntable including the area around the turntable console. These lights will be activated by the aerial master switch.

TURNTABLE CONSOLE LIGHTING

There will be one (1), TecNiq Model T10, white LED light strip mounted in the turntable console cover to illuminate the controls located on both the upper and lower portion of the turntable control station. These lights will be activated by the aerial master switch.

TURNTABLE LIGHTING GUARD

The lights on the turntable will have guards provided to protect them from damage.

INFORMATION CENTER

There will be an information center provided. The information center will operate in temperatures from -40 to 185 degrees Fahrenheit. The information center will employ a Linux operating system and a 7.00" (diagonal measurement) LCD display. The LCD will have a minimum 400nits rated, color display. The LCD will be sunlight readable. The LCD display will be encased in an ABS, black plastic housing with a gray decal. There will be five (5), weather-resistant user interface switches provided. The LCD display can be changed to an available foreign language.

OPERATION

The information center will be designed for easy operation in everyday use. There will be a page button to cycle from one screen to the next screen in a rotating fashion. A video button will allow an NTSC signal into the information center to be displayed on the LCD. If any button is pressed while viewing a video feed, the information center will return to the vehicle information screens. There will be a menu button to provide access to maintenance, setup, and diagnostic screens. All other button labels will be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide vehicle information *At A Glance*. If the information provided on a screen is within acceptable limits, a green background color will be used. If the information provided on a screen is not within acceptable limits, an amber background color will indicate a caution condition and a red background color will indicate a warning condition.



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Every screen in the information center will include the aerial tip temperature, the time (12- or 24-hour mode) and a text Alert Center. The time will be synchronized between all Command Zone color displays located on the vehicle. The Alert Center will display text messages for audible alarms. The text messages will identify any items causing the audible alarm to sound. If more than one (1) audible alarm is activated, the text message for each alarm will cycle every second until the problems have been resolved. The background for the Alert Center will change to indicate the severity of the warning message. Amber will indicate a caution condition and red will indicate a warning condition. If a warning and a caution condition occur simultaneously, the red background color will be shown for all Alert Center messages.

A label will be provided for each button. The label will indicate the function for each active button for each screen. If the button is not utilized on specific screens, it will have a button label with no text.

Symbols will accurately depict the aerial device type the information pertains to such as rear mount ladder, rear mount platform, mid-mount ladder or mid-mount platform.

PAGE SCREENS

The Information center will include the following pages:

The Aerial Main and Load Chart page will indicate the following information:

- Rungs Aligned and Rungs Not Aligned will be indicated with text and respective green or red colored ladder symbols.
- Ladder Elevation will be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder.
- Water Flow (if applicable) will be indicated via a water nozzle symbol and text indicating flow / time.
- Breathing Air Levels will be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graphs shown inside the bottle will indicate oxygen levels above 20%. A red bar graph will indicate oxygen levels at or below 20%. When oxygen levels are at or below 10% the red bar graph will flash.
- The Aerial Load Chart will indicate the load limit on each section of the ladder based on actual ladder position and water flow (if applicable).
- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red



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background. Conditions operating within acceptable limits will be indicated via a green background.

The Aerial Reach and Hydraulic Systems page will indicate the following information:

- Aerial Hydraulic Oil Temperature will be indicated with symbol and text. At a glance features will be utilized.
- Aerial Hydraulic Oil Pressure will be indicated with a symbol and text. At a glance features will be utilized.
- The following calculations will be indicated on a representative vehicle symbol:
 - Aerial Device Extension length.
 - Aerial Device Height indicating the height of the aerial device tip from the ground.
 - Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable.
 - Aerial Device Angle indicating the angle from the vehicle which the device is at.
- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Level Vehicle page will indicate the following information:

- The grade of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol will tilt dependent on the vehicle grade.
- The slope of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol will tilt dependent on the vehicle slope.
- Outriggers status will be indicated via a colored symbol for each outrigger present. Each outrigger status will be defined as one of the following:
 - Outrigger stowed indicated with a silver pan located close to the vehicle
 - Outrigger fully extended indicated with a fully deployed green outrigger
 - Outrigger short-jacked indicated by a yellow outrigger partially deployed
 - Outrigger not set indicated by a red outrigger that is not set on the ground



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- A text box located on the vehicle symbol will be utilized to identify the overall status of the outrigger leveling system. The following status will be indicated in the text box:
- Deployed status will indicate all outriggers are properly set on the ground at full extension
- Shortjacked status will indicate one or more outriggers are set on the ground but not fully extended.
- Not Set status will indicate one or more outriggers is not properly set on the ground.
- Stowed status will indicate all outriggers are stowed for vehicle travel.
- A bedding assist alert will indicate that the aerial device is being aligned by the Command Zone system as the operator lowers the aerial device into the cradle with the joystick.
- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

MENU SCREENS

The following screens will be available through the Menu button:

The View System Information screen will display aerial device hours, aerial PTO hours, ladder aligned for stowing, aerial rotation angle, total water flow (if applicable), and aerial waterway valve status (if applicable).

The Set Display Brightness screen will allow brightness increase and decrease and include a default setting button.

The Configure Video Mode screen will allow setting of video contrast, video color and video tint.

The Set Startup screen allows setting of the screen that will be active at vehicle power-up.

The Set Date and Time screen has a 12- or 24-hour format, and allows setting of the time and date.

The View Active Alarms screen shows a list of all active alarms including the date and time of each alarm occurrence and shows all alarms that are silenced.

The System Diagnostics screen allows the user to view system status for each module and it's respective inputs and outputs. Viewable data will include the module type and ID number; the module version; and module diagnostics information including input or output number, the



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circuit number connected to that input or output, the circuit name (item connected to the circuit), status of the input or output, and other module diagnostic information.

Aerial calibrations screen indicates items that may be calibrated by the user and instructions to follow for proper calibration of the aerial device.

Button functions and button labels may change with each screen.

LOWER CONTROL STATION

A lower control station will be located at the rear of the apparatus in an easily accessible area. The controls and indication labels will be illuminated for nighttime operation. The following items will be furnished at the lower control station and will be clearly identified and conveniently located for ease of operation and viewing:

- Level assist switch
- Override switch to override microprocessor
- Emergency power unit switch

TURNTABLE CONTROL STATION

There will be one (1) device control station located on the left side of the turntable so the operator may easily observe the ladder tip while operating the controls. All elevation, extension and rotation controls will operate from this location. The controls will permit the operator to regulate the speed of the aerial functions, within the safe limits, as determined by the manufacturer and NFPA standards. Each control will be equipped, with a positive lock to hold the control in a neutral position, preventing accidental activation. In addition to the neutral lock, a console cover will be provided at the turntable control station. The controls will be so designed to allow the turntable control station to immediately override the tip controls, if equipped, even if the ladder is being operated by the tip controls.

The following items will also be provided at the turntable control station, clearly identified, lighted for nighttime operation and conveniently located for ease of operation and viewing:

- Intercom controls
- Tip tracking light switch
- Emergency stop switch
- Emergency power unit switch
- Operator's load chart



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- Two (2) position switch for selecting aerial operational speed

HIGH IDLE

The high idle will be controlled by the microprocessor. The microprocessor will automatically adjust the engine rpm to compensate for the amount of load placed upon the system. The system will include a safety device that allows activation of the high idle, only when the parking brake is set and the transmission is placed in neutral.

STABILIZERS

The vehicle will come equipped with a stabilization system consisting of four (4) hydraulically operated stabilizers. The front two (2) will be out and down style, the rear two (2) will be down only. This system will meet or exceed all requirements of the NFPA specifications related to stabilization and setup on sloped surfaces.

The stabilizer/leveling jacks will have a maximum spread of 16' measured from the centerline of the jack footpads when the beams are fully extended. The beams will be 6.88" wide x 9.00" high with 3/4" thick top and bottom plates and 1/2" thick sides of 100,000-PSI minimum yield strength steel. The cylinders will have pilot-operated check valves with thermal relief designed to insure that the beams will not drift out of the stowed position during travel. Wear pads will guide the stabilizers.

The horizontal extension cylinders will be totally enclosed within the beams and will incorporate telescoping hydraulic tubing to supply the jack cylinder hydraulic power. Stabilizer hydraulic hoses will remain stationary during operation of the stabilizers to prevent hose wear and potential failure. The cylinders will be equipped with decelerators to reduce the speed of extension and retraction when the beams are near the fully retracted and extended positions. The stabilizer extension hydraulic cylinders will have the following dimensions: 2.25" bore, 1.38" rod, and 39.25" stroke.

The vertical jack cylinders will be capable of 18.00" ground penetration. The cylinders will be supplied with pilot operated check valves on each jack cylinder to hold the cylinder in the stowed or working position, should a charged line be severed at any point in the hydraulic system. For safety, the integral holding valves will be located in the cylinder base, NOT in the transfer tube. Vertical jack cylinder rods will be fully enclosed by a telescoping inner box to protect the cylinder rods from damage. The stabilizer jack hydraulic cylinders will have the following dimensions: 4.25" bore, 3.00" rod, and 28.88" stroke.

Each stabilizer jack will have a polished stainless steel shield. The stainless steel shield will be a maximum of 14.00" wide so as to allow the extension of the stabilizer between parked cars or other obstacles. This plate will serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges will be flanged back 90 degrees for added strength.



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STABILIZER PADS

The stabilizer footpad will be 12.00" in diameter. The footpad will be attached to the jack cylinder rod by means of a machined ball at the end of the jack cylinder rod which mates to a socket machined into the footpad. The footpad will have the ability to pivot 20 degrees from horizontal in any direction to allow setup on uneven terrain.

AUXILIARY STABILIZER PADS

An auxiliary ground pad will be supplied for each stabilizer to provide additional load distribution on soft surfaces. The pads will be 31" x 26" and made from lightweight composite material. The ground pressure will not exceed 75 pounds per square inch when the ground pads are used and the apparatus is fully loaded and the aerial device is carrying its rated capacity in any position. The pads will be stored in a double stacked configuration, two (2) behind each rear tandem axle in a single bracket.

STABILIZER CONTROLS

A portable stabilizer control box will be provided. The control box will be weatherproof and oil resistant. Each function and indicator light will be labeled on a metal photo panel. The control box can be taken as far away as 15' from the vehicle with an extension cable.

The stabilizer control box will include the following:

- One (1) green power indicator light for stabilizer control that will be illuminated when the aerial master and "PTO" switches in the cab are activated.
- Four (4) electric toggle switches for stabilizers: each toggle switch will control the extend/retract (front only) and raise/lower of its respective stabilizer to allow vehicle set up in restricted areas and/or on uneven surfaces.
- Auto leveling assist switch: The outrigger control system will incorporate a computerized self leveling system in addition to the standard outrigger controls. The operator will have the option to manually or automatically level the truck. The computerized system will ensure full outrigger extension, proper jack penetration, and will level the vehicle within 1/2 a degree of level for safe operation of the aerial device.
- One (1) electric toggle switch for the engaging the emergency power unit.
- One (1) red "stabilizer not stowed" indicator light: this light will illuminate when the stabilizers are not in the fully stowed position.
- Two (2) fully extended beams green indicator lights: these lights will be illuminated when each of the respective stabilizer beams are fully extended.



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- Four (4) firm on ground green indicator lights: each light will be illuminated when its respective stabilizer shoe is in the load supporting condition.

Each toggle switch will activate the engine fast idle automatically.

Manual override will be supplied for each stabilizer control valve.

A "Stabilizers Not Stowed" indicator will be provided in the driver's compartment. It will illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the apparatus if moved. The stabilizer system will also be wired to the "Do Not Move Indicator Light", which will flash whenever the apparatus parking brake is not fully engaged and the stabilizers are not fully stowed.

CRADLE INTERLOCK SYSTEM

A cradle interlock system will be provided, to prevent the lifting of the aerial from the nested position, until the operator has positioned all the stabilizers in a load supporting configuration. A switch will be installed at the cradle, to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

STABILIZER CONTROL BOX ALUMINUM DOOR

A vertically hinged smooth aluminum door will be provided over the stabilizer control box. The door will be hinged outboard.

HYDRAULIC SYSTEM

All hose assemblies will be assembled and crimped by the hose manufacturers certified technician.

All manufacturing employees responsible for the installation of hydraulic components will be properly trained. Training will include: proper handling, installation, torque requirements, cleanliness and quality control procedures for hydraulic components.

Hoses used in the aerial hydraulic system will be of a premium quality hose with a high abrasion resistant cover. All pressure hoses will have a working pressure of 4000 psi and a burst pressure rating of 16,000 psi.

All hydraulic fittings and tubing will be plated to minimize corrosion.

The fitting will use an O-ring seal where possible to minimize hydraulic leaks.

An interlock will be provided that prevents activation of the hydraulic pump until the transmission is placed in neutral and the parking brake is set as outlined in the current NFPA 1901 standard.



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The system will meet the performance requirement of the current NFPA 1901 standard, which requires adequate cooling less than 2.5 hours of operations.

All hydraulic components that are non-sealing whose failure could result in the movement of the aerial will comply with current NFPA 1901 standards and have burst strength of 4:1.

Dynamic sealing components whose failure could cause aerial movement will have a margin of 2:1 on maximum operating pressure per the current NFPA 1901 standard.

All hydraulic hoses, tubes, and connections will have a minimum burst strength of 4:1 per the current NFPA 1901 standard.

A chassis mounted positive displacement piston pump for consistent pressure and rapid responses will supply hydraulic power for all aerial operations. The positive displacement pump will provide 3,150psi. The hydraulic pump will be solely dedicated to aerial operations.

Each aerial will be evaluated as to the region and climate where it will be used to determine the optimum viscosity and proper oil grade. Oil viscosity will be based on an optimum range of 80 to 1000 SUS during normal aerial use. Before shipment of the unit, an oil sample will be taken and analyzed to confirm the oil is within the allowable ISO grade tolerance.

The aerial hydraulic system will have a minimum oil cleanliness level of ISO 18/15/13 based on the ISO 4406:1999 cleanliness standard. Each customer will receive a certificate of actual cleanliness test results and an explanation of the rating system.

Each aerial will include an oil sample port, identified with a yellow dust cap and a label, for subsequent customer testing.

Ball valves will be provided in the hydraulic suction lines to permit component servicing without draining the oil reservoir.

The aerial will incorporate the use of trombone steel tubes inside the stabilizer beams to eliminate hydraulic hose wear and leaks.

Hydraulic power to the ladder will be transferred from the pedestal by a hydraulic swivel.

The system hydraulic pressure will be displayed on the turntable display.

The hydraulic system will be additionally protected from excessive pressure by a secondary pressure relief valve set at 3,150 psi. In the event the main hydraulic pump compensator malfunctions, the secondary relief will prevent system damage.



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HYDRAULIC CYLINDERS

All cylinders used on the aerial device will be produced by a manufacturer that specializes in the manufacture of hydraulic cylinders.

Each cylinder will include integral safety holding cartridges.

Each cylinder will be designed to a minimum safety factor of 4:1 to failure.

All safety holding cartridges will be installed at the cylinder manufacturer, in a controlled clean environment to avoid possible contamination and or failure.

POWER TAKEOFF/HYDRAULIC PUMP

The apparatus will be equipped with a power takeoff driven by the chassis transmission and actuated by an electric shift, located inside the cab. The power takeoff which drives the hydraulic pump will meet all the requirements for the aerial unit operations.

An amber indicator light will be installed on the cab instrument panel to notify the operator that the power takeoff is engaged.

An interlock will be provided that allows operation of the aerial power takeoff shift only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or drive position after the driveline has been disengaged from the rear axle.

The hydraulic system will be supplied by a variable displacement load and pressure compensating piston pump. The pump will meet the demands of all three simultaneous aerial functions. The pump will provide proper flow for single aerial function with the engine at idle speed. A switch will be provided on the control console to increase the engine speed for multiple function operation.

EMERGENCY PUMP

The hydraulic system will be designed with an auxiliary power unit meeting the guidelines of the current NFPA 1901 standard.

The aerial will be equipped with an emergency hydraulic pump, electrically driven from the truck batteries. The pump will be capable of running for 30 minutes for limited aerial functions to stow the unit in case of a main pump or truck system failure. A momentary switch will be located at the stabilizer and aerial control locations to activate the emergency pump.

AERIAL CONTROL VALVE

The aerial hydraulic control valve will be designed with special spool flows, limiting the oil flow for the designed function speed. The valve will be electrically controlled and be located in the control console with the handles oriented downward for manual operation. The activation



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handles will be spaced a minimum of 3.50" for ease of operation. The valve spools will be designed to bleed off downstream pressure, in the neutral position and allow proper sealing of any cylinder holding cartridge.

OIL RESERVOIR

The oil reservoir will have a minimum capacity of 38 gallons. The oil fill location will be easily accessible and be labeled "Hydraulic Oil Only" and also indicate the grade of oil that is installed in the reservoir. The fill will have a desiccant breather filter with a water capacity of 4 fluid ounces and a 5 micron rating. A drain hose will be included and will terminate with a quarter turn ball valve.

Two suction ports will be provided, one for the main hydraulic pump and one for the emergency pump. The main suction will be slightly elevated off the bottom of the reservoir and include a 100 mesh suction strainer. The emergency suction port will be closer to the bottom of the reservoir to provide some reserve oil for emergency operation.

A six (6) disc type magnetic drain will also be provided to collect any ferrous contaminants.

A float type sending unit in the reservoir will provide an indication of oil level on an electronic display. A temperature sending unit in the reservoir will provide indication of the oil temperature on an electronic display.

The hydraulic oil reservoir will be labeled per the current edition of NFPA 1901 standard.

RETURN FILTER

The low pressure oil return filter will be integrated with the hydraulic manifold and designed to prevent oil loss during filter change. A 50 psi bypass will be included to protect the element and hydraulic system during lower than normal operating temperatures. The system will incorporate the following filter to provide dependable service:

- return filter: beta 200 at 6 micron

HYDRAULIC SWIVEL

The aerial ladder will be equipped with a three (3) port, high pressure hydraulic swivel which will connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel will allow for 360 degree continuous rotation of the aerial.



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ELECTRIC SWIVEL

The ladder will be equipped with an electric swivel to allow 360 degrees rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of 28 collector rings will be provided that are capable of supplying 20 amp continuous service. All collector rings will be enclosed and protected with desiccant plugs against condensation and corrosion. No oil or silicone will be used.

12-BIT ABSOLUTE ENCODER

The aerial ladder will be equipped with a 12-Bit Absolute Encoder which provides 4096 counts per shaft turn for position and direction reference.

The 12-Bit Absolute Encoder will provide a unique binary word to reference each position and direction for all 360 degrees of rotation.

If the power is interrupted for any reason, the 12-Bit Absolute Encoder will allow power to be returned to the system without having to re-zero the settings.

The 12-Bit Absolute Encoder will be an integral part of a micro-processor based control system.

ELECTRICAL SYSTEM

The 107' heavy duty ladder shall utilize a microprocessor-based control system. The system shall consist of the following components:

A tethered stabilizer control shall be provided. The tethered control shall be weatherproof and oil resistant. A Super Bright LED indicator light shall be labeled on a metal photo panel for each function. The electrical connection at the tethered control shall be permanently attached by a strained relieved coil cord that shall allow the operator to move 14ft away from the electrical connection for operation.

- Remote Stabilizer Controls
- Weatherproof and oil resistant
- One (1) green "power" indicator light
- One (1) red "stabilizer not stowed" indicator light
- One (1) electric toggle switch for auto level assist
- One (1) electric toggle switch for the emergency power unit
- One (1) electric toggle switch for each stabilizer to control:
 - Extend/retract function (front only)
 - Raise/lower function
- One (1) green "stabilizer fully extended" indicator light for each front stabilizer
- One (1) green "firm on ground" indicator light for each stabilizer



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Control System Modules

Each of the control system modules shall be configured as follows:

- Sealed to a NEMA 4 rating
- Operating range from -40 degrees F to 185 degrees F (-40 degrees C to 85 degrees C)
- Communicate using J1939 data link
- Two (2) diagnostic LED light
- One (1) green light that illuminates when module has power (B+) and ground
- One (1) red light that flashes to indicate the module is capable of communicating via the data link
- Ground matrix identification system

The following control system modules shall be used:

Control Module

- Main controller for the system
- USB connection allows for computer diagnostics

Power Module

- Built-in fault sensing
- Eight (8) digital outputs
- Pulse width modulating (PWM) capable
- 10A continuous per output
- Circuit protection based on actual current draw (not affected by heat)

Constant Current Module

- Built-in fault sensing
- Three (3) analog inputs
- Eight (8) digital outputs
- Pulse width modulating (PWM) capable
- 3A continuous per output
- Circuit protection based on actual current draw (not affected by heat)
- Closed Loop System

Input Module

- 16 software selectable (digital or analog) inputs

Output Module



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- 16 digital outputs

Input/Output Module

- Eight (8) software selectable (digital or analog) inputs
- Eight (8) digital outputs

SPOTLIGHTS

There will be four (4) Whelen bail mount Micro Pioneer, Model MPB*, 12 volt DC LED lights furnished.

- One (1) will be mounted on the driver's side of the base section of the ladder.
- One (1) will be mounted on the passenger's side of the base section of the ladder.
- One (1) will be mounted on the driver's side tip of aerial.
- One (1) will be mounted on the passenger's side tip of aerial.

The painted parts of this light assembly to be white.

Power to the "tracking lights" will be controlled by an on/off switch at the turntable control operator's position.

The lights at the platform will be controlled by platform/tip and turntable.

STABILIZER WARNING LIGHTS

There will be four (4) Whelen®, Model M6*, LED flashing warning lights with Whelen, Model M6FC, chrome flanges installed, one (1) on each stabilizer cover panel.

- The front stabilizer pan lights will be red LED with a lens color the same as the LEDs
- The rear stabilizer pan lights will be red LED with a lens color the same as the LEDs

These warning lights will be activated by the same switch as the side warning lights.

STABILIZER BEAM WARNING LIGHTS

Two (2) 4.00" diameter red LED flashing lights will be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward. The lights will be Grote Supernova 40 series LED lights. The lights will be recessed in the horizontal beam of the stabilizer. These warning lights will be activated with the aerial master switch.



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STABILIZER SCENE LIGHTS

There will be one (1) Amdor®, Model AY-LB-12HW012, 190 lumen, 12" long, white LED strip light installed under each stabilizer beam to illuminate the surrounding area. A total of four (4) lights will be installed. The lights will be activated by the aerial master switch.

120-VOLT RECEPTACLE AT TIP

A 120-volt, 20 amp, three (3)-prong straight blade receptacle with weatherproof cover will be provided at the tip of the aerial device.

COMMUNICATION SYSTEM

An Atkinson communication system will be furnished between the aerial tip and the turntable operator's position. The communication system will be a two (2)-way system with the communication speaker at the tip requiring no operator attention to transmit or receive. The transmitting and receiving volume controls will be located at the turntable operator's position.

BREATHING AIR TO TIP

Breathing air will be supplied to the tip of the aerial device.

The bottle will be mounted to the underside of the base section, forward of the elevation cylinders.

The air system will incorporate a 510 cubic foot, 6000 pounds per square inch cylinder, with regulator and two (2) gauges, 50' refill hose, 400-pound system alarm, and one (1) CEJN brass series 344 coupling. There will be a weather resistant storage compartment for one (1) air mask provided at the tip.

The breathing air cylinder will be designed and constructed to conform to the requirements of the United Nations (UN) on the transportation of dangerous goods.

BREATHING AIR LEVEL AND WARNING SYSTEM

The level of breathing air remaining will be visible on the color display at the turntable control console.

The display will incorporate a low-pressure warning circuit that activates an audible alarm when 20% maximum air cylinder capacity remains. An audio alarm will also be provided at the tip.

The turntable display will incorporate a solid red bar breathing air graphic when air cylinder capacity is between 11% and 20% and a flashing red bar graphic when air capacity falls to 10% or less.



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LIFTING EYE ASSEMBLY - ROPE RESCUE ATTACHMENT

A lifting eye assembly will be provided that is designed to evenly distribute load at the tip of the aerial. The lift eye assembly is retained by two (2) locking pins, one (1) at each end outboard side of the egress. Leveling is maintained by the lifting eye assembly rotating within the egress mounting.

AERIAL TURNTABLE MANSAVER™ BARS

ManSaver™ bars will be installed at the aerial turntable.

WATER SYSTEM

A waterway system will be provided consisting of the following components and features:

A 5.00" pipe will be connected to the water supply on one end and to a 5.00" internal diameter water swivel at the rotation point of the turntable. The water swivel will permit 360 degree continuous rotation of the aerial device.

The 5.00" waterway swivel is to be routed through the rotation point up to the heel pin swivel. The heel pin swivel will allow the water to flow to the ladder pipe while elevating the aerial ladder from -10 degrees to 77 degrees. The heel pivot pin is not integral with the waterway swivel at any point. The design of the waterway will allow complete servicing of the waterway swivel without disturbing the heel pivot pin.

The integral telescopic water system will consist of a 4.50" diameter tube in the base section, a 4.00" diameter tube in the mid-section and a 3.50" diameter tube in the fly section. The telescopic waterway will be constructed of anodized aluminum pipe.

The aerial will be capable of discharging up to 1000 gpm at 100 psi parallel to the ladder and 90 degrees to each side of center while maintaining the rated tip load.

The aerial will be capable of discharging between 1001 and up to 1500 gallons per minute at 100 psi parallel to the ladder and 40 degrees to each side of center while maintaining the rated tip load.

The master stream will be capable of flow up to 30 degrees above horizontal.

An adjustable pressure relief valve will be furnished to protect the aerial waterway from a pressure surge.

A 1.50" drain valve will be located at the lowest point of the waterway system.





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WATERWAY SEALS

The waterway seals will be of type-B PolyPak design, composed of nitroxile seal and a nitrile wiper, which together offer maximum stability and extrusion resistance on the waterway. The seal will be capable of withstanding pressures up to 2000 psi, temperatures in excess of 250 degrees Fahrenheit and have resistance to all foam generating solutions. The seals will be internally lubricated.

The waterway seals will have automatic centering guides constructed of synthetic thermalpolymer. The guides will provide positive centering of the extendible sections within each other and the base section to insure longer service life and smoother operation.

AERIAL MONITOR

An Akron Model 3480 monitor with stow and deploy will be provided at the tip with a Akron 1250 gpm Model 1578. This monitor will allow for an additional 30 degrees of travel above horizontal at the aerial tip.

The monitor's functions will be controlled electrically from two (2) separate locations. One (1) control will be located at the control console and the other at the ladder tip.

There will be a courtesy light at the tip of the aerial to illuminate the controls.

If the aerial has a quick-lock waterway, a limit switch will be provided to disable the extended vertical travel when the monitor is locked to the lower ladder section.

AERIAL WATERWAY FLOW METER

Waterway flow, including total water flowed, will be monitored by the microprocessor. An LCD display will be located at the turntable control station.

REAR INLET

A 6.00" NST inlet with 5.00" plumbing to the aerial waterway will be provided at the rear of the apparatus with screen. It will be furnished with a 6.00" x 5.00" chrome plated adapter and a 6.00" chrome plated, rocker lug cap.

WATERWAY LOCKING SYSTEM

The aerial ladder waterway monitor will be capable of being positioned at either the fly section or at the next lower section of the ladder.

The monitor location will be changeable by the use of a single handle, located at the side of the ladder.

The handle, attached to a cam bracket, will simply be moved forward to lock the monitor at the fly section and back to lock it to the previous section.



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There will be no pins to remove and reinstall.

The monitor will be operational at all times, regardless of its position, without connecting or disconnecting electrical lines.

TOOLS

The following tools will be provided for retorquing of all specified bolts as recommended by the manufacturer:

Torque Wrench

All Required Extensions, Sockets and Adapters

4-to-1 Multiplier

MANUALS

Two (2) operator maintenance manuals and two (2) wiring diagrams pertaining to the aerial device will be provided with the apparatus at time of pick-up.

INITIAL INSTRUCTION

On initial delivery of the fire apparatus, the contractor will supply a qualified representative to demonstrate the apparatus and provide initial instruction to the fire department regarding the operation, care, and maintenance of the apparatus for a period of three (3) consecutive days.

one (1) 2.5" FNST caps with stainless steel chains shall be provided in the loose equipment. These caps shall have a chrome finish.

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 8.9.3 will be provided by the fire department.

- Two (2) 3 ft - 4 ft plaster hooks with D handles mounted in brackets fastened to the apparatus.
- Two (2) crowbars.
- Two (2) claw tools.
- Two (2) 12 lb (5 kg) sledgehammers.



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- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Six (6) salvage covers, each a minimum size of 12 ft × 18 ft (3.6 m × 5.5 m).
- Four (4) combination spanner wrenches.
- Two (2) scoop shovels.
- One (1) pair of bolt cutters, 24" (0.6 m) minimum.
- Four (4) ladder belts meeting the requirements of NFPA 1983.
- One (1) 150 ft (45 m) light-use life safety rope meeting the requirements of NFPA 1983.
- One (1) 150 ft (45 m) general-use life safety rope meeting the requirements of NFPA 1983.
- Two (2) 150 ft (45 m) utility ropes having a breaking strength of at least 5000 lb (2300 kg).
- One (1) box of tools to include the following:
 - one (1) hacksaw with three (3) blades
 - one (1) keyhole saw
 - one (1) 12" (.3 m) pipe wrench
 - one (1) 24" (.6 m) pipe wrench
 - one (1) ballpeen hammer
 - one (1) pair of tin snips
 - one (1) pair of pliers
 - one (1) pair of lineman's pliers
 - assorted types and sizes of screwdrivers
 - assorted adjustable wrenches
 - assorted combination wrenches



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- One (1) 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 (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- One (1) double female 2.50" adapter with National Hose Threads (if equipped with a fire pump).
- One (1) double male 2.50" adapter with National Hose Threads (if equipped with a fire pump).
- One (1) rubber mallet, for use on suction hose connections (if equipped with a fire pump).
- Two (2) hydrant wrenches (if equipped with a fire pump).
- 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, will be carried mounted in brackets fastened to the apparatus (if equipped with a fire pump).
- 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 will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6 (if equipped with a fire pump).
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake (if equipped with a fire pump).
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake (if equipped with a fire pump).

SOFT SUCTION HOSE PROVIDED BY FIRE DEPARTMENT

The fire department will provide suction or supply hose.



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DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 8.9.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 8.9.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 8.9.3 requires two (2) flathead axes mounted in brackets fastened to the apparatus.

The axes are not on the apparatus as manufactured. The fire department will provide and mount the axes.

PICKHEAD AXES PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 8.9.3 requires three (3) pickhead axes mounted in brackets fastened to the apparatus.

The axes are not on the apparatus as manufactured. The fire department will provide and mount the axes.

PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

7. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
8. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel



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or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion. A final pure water rinse will be applied to all metal surfaces.

9. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
10. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
11. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.
12. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.
13. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacture.

Each batch of basecoat color is checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color is verified again to make sure that it matches the color standard. Electronic color measuring equipment is used to compare the color sample to the color standard entered into the computer. Color specifications are used to determine the color match. A Delta E reading is used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

Pierce Manufacturing paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) meet or exceed the Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels meet or exceed the #6 A.C.T. standard in critical areas. These requirements are met in order for the exterior paint finish



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to be considered acceptable. The Pierce Manufacturing written paint standards will be available upon request.

The cab and the body will be painted #20 white.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

GALVANIZED CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be hot dip galvanized before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be hot dip galvanized are:

- Frame rails
- Frame liners
- Cross members



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- Front frame extension

All galvanized components are inspected for compliance with ASTM specifications.

Battery boxes will be stainless steel.

All components that are not galvanized will be painted primer and gloss black paint.

COMPARTMENT INTERIOR PAINT

The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

AERIAL DEVICE PAINT COLOR

The aerial device paint procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the aerial device structural components above the rotation point will be thoroughly cleaned and mechanically shot-blasted to remove metal impurities and prepare the aerial for painting.
2. Zinc Rich Primer - Zinc rich primer will be applied to the torque box and stabilizers.
3. Primer/Surfacer Coats - A two (2) component epoxy primer/surfacer will be applied to the mechanically shot-blasted metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. All seams will be caulked with a two (2) component epoxy caulk before painting.
4. Hand Sanding - The primer/surfacer coat of the outer surfaces of the hand rails and base rails will be lightly sanded to a smooth finish.
5. Primer Coat - A two (2) component epoxy primer coat will be applied over the sanded primer.
6. Topcoat Paint - Urethane base coat will be applied to opacity for correct color matching.
7. Clear Coat - Two (2) coats of an automotive grade two (2) component urethane will be applied.

Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate.

All buy out components, such as monitor, nozzle, gauges, etc. will be supplied as received from the vendor.

Removable items such as brackets will be removed and painted separately to ensure paint coverage behind all mounted items.



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The aerial device components will be painted as follows using the aforementioned seven (7) step finishing process:

- Aerial device ladder sections and extension cylinders: blue white 20
- Aerial egress: #50 red (will be contrasting to the aerial device color)
- Aerial turntable: blue white 20
- Aerial control console: blue white 20
- Aerial lift cylinders: blue white 20
- Aerial torque box, support structure and components below the rotation point: gloss black primer
- Aerial stabilizers: black 101
- Aerial boom support: gloss black primer

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the rear wall and aluminum doors. Rear compartment doors, stainless steel access doors, and the rear bumper will not be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

REFLECTIVE STRIPE ON STABILIZERS

There will be a 4.00" wide yellow reflective stripe provided on the forward and rear facing side of all aerial stabilizers.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.



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OUTLINE, REFLECTIVE STRIPE

A Black outline will be applied on the top and the bottom of the reflective band. There will be one (1) set of outline stripes required.

INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS

There will be alternating chevron striping located on the inside of each cab and crew cab door.

The striping will consist of the following colors:

The first color will be black

The second color will be gold

The size of the striping will be 4.00".

LETTERING

Forty-one (41) to sixty (60) reflective lettering, 3.00" high, with outline will be provided.

LETTERING

Twenty-one (21) to forty (40) reflective lettering, 10.00" high, with outline will be provided.

LETTERING, SCRIPT

Script lettering shall be provided on the rear body compartment door. The lettering will state "Everyone Comes Home".

EMBLEMS

There will be two (2) monogram emblem(s) installed on each side on cab door, with "DENVER" above the monogram and "FIRE DEPT." below the monogram.

The monogram and lettering will be made of gold reflective material with black outline.

The design will be the same as on previous units.

EMBLEMS

There will be a pair of American flag emblems, installed in the window over the rear cab door. The emblem will be waving and made out of Gerber Vision material.

EMBLEM

There will be one (1) emblem(s), approximately 24.00" - 25.00" wide in size, installed R1. The emblem will feature a "Flying American Flag" and an "Eagle Head".

two (2) Akron Trimeese (3) 2.5"(F)NST X 6"(F)NST will be provided.



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MANUAL, FIRE APPARATUS PARTS

Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

The manual will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate a part

The manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine



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- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this document.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce custom chassis limited warranty certificate, WA0284, is included with this document.

ENGINE WARRANTY

A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this document.

STEERING GEAR WARRANTY

A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included with this document.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this document.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this document.



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ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor Wabco™ABS brake system limited warranty certificate, WA0232, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this document.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this document.

CAMERA SYSTEM WARRANTY

A Pierce fifty four (54) month warranty will be provided for the camera system.

COMPARTMENT LIGHT WARRANTY

The compartment lights will not offer an extended warranty.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

WATER TANK WARRANTY

A UPF poly water tank limited warranty certificate, WA0195, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce apparatus body limited warranty certificate, WA0009, is included with this document.



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ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY

A R-O-M Corporation roll-up door limited warranty shall be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for a period of seven (7) years. The door ajar switch will be warranted for a period of three (3) years and all other electrical components will be warranted for a period of one (1) year. A seven (7) year limited warranty will be provided on painted roll up doors.

The limited warranty certificate, WA0206, is included with this document.

SIX (6) YEAR PARTS, ONE (1) YEAR LABOR

The pump and its components will be provided with a six (6) year parts and one (1) year labor limited warranty. The manufacturer's warranty will provide that the pump and its components will be free from failures caused by defects in material and workmanship that would arise under normal use and service.

A copy of the warranty certificate will be submitted with the bid package.

TEN (10) YEAR PUMP PLUMBING WARRANTY

The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this document.

TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY

The Pierce device limited warranty certificate, WA0052, is included with this document.

AERIAL SWIVEL WARRANTY

An Amity five (5) year limited swivel warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

AERIAL WATERWAY WARRANTY

An Amity ten (10) year limited waterway warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

FOUR (4) YEAR PRO-RATED PAINT AND CORROSION

A Pierce aerial device limited pro-rated paint warranty certificate, WA0047, is included with this document.

SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY

A Harrison Hydra-Gen limited warranty certificate, WA0285, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this document.



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ONE (1) YEAR MATERIAL AND WORKMANSHIP

The Pierce graphics fading and deterioration limited warranty limited warranty certificate, WA0168, is included with this document.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of bid.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer will provide a cab integrity certification with this document. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Roof Crush

The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

Additional Roof Crush

The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.



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Side Impact

The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact

The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact

The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420).

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.



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SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 75 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

CAB AIR CONDITIONING PERFORMANCE CERTIFICATION

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 67 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar air conditioning system has been tested and has met these criteria. The certification will be available at the time of delivery.

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
 - The nameplate rating of the alternator.
 - The alternator rating under the conditions specified per:
 - Applicable NFPA 901 or 1906 (Current Edition).
 - The minimum continuous load of each component that is specified per:
 - Applicable NFPA 901 or 1906 (Current Edition).



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- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

6/29/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER T. Charles Wilson Insurance Service 384 Inverness Parkway Suite 170 Englewood, CO 80112	CONTACT NAME: PHONE (A/C, No, Ext): (303) 368-5757		FAX (A/C, No): (303) 368-5863
	E-MAIL ADDRESS: info@wilsonins.com		
INSURED Front Range Fire Apparatus Ltd. 7600 Miller Ct. Longmont, CO 80504	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A : Arch Insurance Company		11150
	INSURER B : Pinnacol Assurance		41190
	INSURER C :		
	INSURER D :		
	INSURER E :		
INSURER F :			

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PROJECT <input checked="" type="checkbox"/> LOC OTHER:			MFPK08553106	12/27/2019	12/27/2020	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 GARAGE LIABILITY \$ Included
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY			MFCA08347006	12/27/2019	12/27/2020	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input type="checkbox"/> RETENTION \$			MFUM07987206	12/27/2019	12/27/2020	EACH OCCURRENCE \$ 3,000,000 AGGREGATE \$ Aggregate \$ 3,000,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input type="checkbox"/> Y / N If yes, describe under DESCRIPTION OF OPERATIONS below		N / A	4043254	5/1/2020	5/1/2021	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 500,000 E.L. DISEASE - EA EMPLOYEE \$ 500,000 E.L. DISEASE - POLICY LIMIT \$ 500,000
A	Garage & Dealers (Si)			MFCA08347006	12/27/2019	12/27/2020	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 As required by written contract, the City and County of Denver, Its Elected and Appointed Officials, Employees and Volunteers are included as Additional Insured as respects the Commercial General Liability and Business Auto.

CERTIFICATE HOLDER

CANCELLATION

City and County of Denver 201 West Colfax Avenue Department 304 Denver, CO 80202	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE