



**GOLDEN
STATE**
FIRE APPARATUS

PROPOSAL PREPARED FOR

**City of Santa Rosa
Fire Department**
Pierce Manufacturing, Inc.
Arrow XT 107' TDA Aerial
December 11, 2019
HGAC Interlocal Contract #10-2428
Pierce HGAC Contract #FS12-19

SALES CONSULTANT

Jon Bauer
Golden State Fire Apparatus, Inc.
7400 Reese Road
Sacramento, CA 95828
916.330.1638 Office
530.351.2151 Cell
jbauer@goldenstatefire.com

PARTS, SERVICE & SUPPORT

Golden State Emergency Vehicle Service, Inc.
7400 Reese Road
Sacramento, CA 95828
916.330.1638 Office
parts@goldenstatefire.com



www.goldenstatefire.com
7400 Reese Road
Sacramento, CA 95828
Office 916.330.1638
Fax 916.330.1649

PROPOSAL PREPARED FOR:

City of Santa Rosa Fire Department
2373 Circadian Way
Santa Rosa, CA 95407

Submitted Date:	December 11, 2019
Proposal Number:	51211-19A
Expiration Date:	January 31, 2020
Sales Consultant:	Jon Bauer

Pursuant to this proposal (the "Proposal"), Golden State Fire Apparatus, Inc. ("GSFA") hereby proposes to furnish City of Santa Rosa Fire Department ("Customer"), the following fire apparatus and equipment, hereinafter called the "Product":

OPTION "A" - 100% PRE-PAYMENT AT TIME OF ORDER

#	Description	Price
A	One (1) Pierce Manufacturing, Inc. Arrow XT 107' Ascendant Tractor Drawn Aerial	1,409,332.52
B	Discount HGAC Consortium Purchase – Product Code FS19VA11	(46,250.32)
C	Discount For 100% Pre-Payment at Time of Order	(49,593.04)
SUBTOTAL		1,313,489.16
9.00% State Sales Tax		118,214.02
California Tire Fee		14.00
GRAND TOTAL		1,431,717.18

PROPOSAL SUMMARY

This Proposal includes the following items in accordance with the specifications hereto attached:

- Fire apparatus and equipment
- Pre-construction conference at customer location
- Factory construction review inspection
- Factory final inspection
- Delivery to GSFA service center in Sacramento
- Pre-delivery inspection/services by GSFA
- Final delivery from service center to Customer
- Demonstration and familiarization of the Product
- California Tire Fee

PRODUCT COMPLETION

The Product shall be built in accordance with the specifications hereto attached within approximately 300 to 345 calendar days after Customer's acceptance of this Proposal, subject to the force majeure provisions contained in the Purchase Agreement (defined below). The Purchase Agreement shall further describe the delivery schedule for the Product.

DELIVERY LOCATION

Product shall be shipped in accordance with the specifications hereto attached and be delivered to you at SANTA ROSA, CALIFORNIA. Prior to final delivery of the Product to Customer, Customer agrees to provide proof of liability and physical damage insurance to GSFA. GSFA shall not deliver the Product until such proof of insurance is provided.

ACCEPTING THIS PROPOSAL

In the event Customer wishes to purchase the Product described in this Proposal and the attached specifications, then, prior to the expiration date listed on page 2 of this Proposal, Customer shall sign and return this Proposal. Thereafter, GSFA and Customer will endeavor to enter into a purchase agreement incorporating this Proposal and including additional terms (a "Purchase Agreement"). If Customer returns a signed copy of this Proposal alone, GSFA will send Customer its form of Purchase Agreement for Customer's review and signature. If Customer desires to use its standard form of purchase order as the Purchase Agreement, then Customer should return a signed copy of this Proposal along with a copy of such purchase order. **All purchase orders shall be made out to GSFA.** GSFA will review such purchase order and contact the Customer regarding any required revisions. Only upon a full execution of a Purchase Agreement shall GSFA and Customer be obligated to purchase and sell the Product set forth in this Proposal.

TERMS AND CONDITIONS

The following Terms and Conditions are hereby made part of this Proposal:

- 1. Payment Terms, Payment within 15 Calendar Days of Contract Signing** – Customer shall pay the Grand Total within 15 Calendar Days of Contract Signing to GSFA. It is the responsibility of the Customer to have full payment ready within this timeframe. If payment is late or delivery is delayed pending payment, a daily finance charge of \$150.00 and a daily storage fee of \$50.00 may apply until such payment is received. Due to insurance liability, the Product(s) will not be left at the Customer's location without full acceptance and payment or prior written agreement between the Customer and GSFA.
- 2. Multiple Unit Purchase** – If the Purchase Price includes pricing for multiple units, the price stated on this Proposal shall only be valid if the quantity of Products being proposed are purchased at the same time, pursuant to the same Purchase Agreement.
- 3. Stock / Demo Units** – If applicable, any stock/demo units, including those identified by this Proposal, are available for sale on an as-is, first-come and first served-basis. Regardless of this Proposal, the first Customer to enter into a Purchase Agreement identifying any such stock/demo units shall obtain said units.
- 4. Order Changes** – The Customer may request that GSFA incorporate a change to the Product or the Specifications for the Product by delivering a written change order to GSFA, which shall include a description of the proposed change sufficient to permit GSFA to evaluate the feasibility of such change (a "Change Order"). GSFA will provide Customer a written response (a "Response") stating (i) whether GSFA will accommodate such Change Order (which GSFA may decide in its sole and absolute discretion) and (ii) the terms of the modification to the order, including any increase or decrease in the Purchase Price resulting from such Change Order, and any effect on production scheduling or Delivery resulting from such Change Order. Customer shall have seven (7) days after receipt of the Response to notify GSFA as to whether Customer desires to make the changes GSFA has approved in the Response. In the event Customer counter-signs GSFA's Response, Customer shall pay the increase (or be refunded the decrease) in the Purchase Price prior to final delivery to Customer location.
- 5. Force Majeure** – GSFA shall not be responsible nor deemed to be in default on account of delays in performance due to causes which are beyond GSFA's and manufacturer's control and which make GSFA's performance impracticable, including but not limited to wars, insurrections, strikes, riots, fires, storms, floods, other acts of nature, explosions, earthquakes, accidents, any act of government, delays in transportation, inability to obtain necessary labor supplies or manufacturing facilities, allocation regulations or orders affecting materials, equipment, facilities or completed products, failure to obtain any required license or certificates, acts of God or the public enemy or terrorism, failure of transportation, epidemics, quarantine restrictions, failure of vendors (due to causes similar to those within the scope of this clause) to perform their contracts or labor troubles causing cessation, slowdown, or interruption of work.
- 6. Cancellation/Termination** – In the event Customer and GSFA enter into a Purchase Agreement and Customer thereafter cancels or terminates the Purchase Agreement, GSFA will charge a cancellation fee as follows: (a) 10% of the Purchase Price after order is accepted and entered by GSFA; (b) 20% of the Purchase Price after completion of the pre-construction phase of the order process; and (c) 50% of the Purchase Price after the requisition of any materials or commencement of any manufacturing or assembly of the Product by either GSFA or the manufacturer of the Product. The tier of cancellation fee applicable to any cancellation shall be in the sole and absolute discretion of GSFA.
- 7. State Sales Tax** – Customer shall be responsible for the cost of state sales tax associated with, or attributable to the Product. The taxes owed by Customer for the Product is subject to adjustment for the applicable state sales tax rate in effect when the Product is delivered to the Customer. Therefore, the sales tax will be increased or decreased at the time of delivery if a change in the sales tax rate has occurred, in which case Customer shall pay GSFA (or be refunded by GSFA) the applicable change in sales tax.
- 8. Proposal Expiration** – After the Expiration Date shown on page one of this Proposal, Customer shall require GSFA's written consent to accept this Proposal.
- 9. Governing Law** – This Proposal is to be governed by and under the laws of the state of California.

Thank you for providing Golden State Fire Apparatus, Inc. with the opportunity to provide this proposal. If you have any questions regarding the options presented or need additional options, please contact me.

Sincerely,



Jon Bauer

Golden State Fire Apparatus, Inc.



**GOLDEN
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I, _____ authorized representative of the CITY OF SANTA ROSA agrees to purchase the proposed Product(s) and agree to the terms and conditions of this proposal and the specifications hereto attached.

SIGNATURE: _____

TITLE: _____

DATE: _____

Proposal For: City of Santa Rosa Fire Department

Prepared By: Jon Bauer, Sales Consultant, **Golden State Fire Apparatus, Inc.**

December 11, 2019



PERFORM. LIKE NO OTHER.™

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

Golden State Fire Apparatus, Inc. has been in business for more than 25 years. We are the Central and Northern California authorized dealership for the finest fire apparatus in the nation. Our attention to detail and commitment to customer satisfaction is our primary goal and top priority. We would like to say, **“Thank You”** for providing us this opportunity to present you with this proposal for one **Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial**. Your review and consideration of our detailed proposal is greatly appreciated.

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 60 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 51,000 apparatus, including more than 27,000 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 757,000 total square feet of floor space situated on approximately 97 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 proposal will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this proposal 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.

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.

CITY OF SANTA ROSA FIRE DEPARTMENT

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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 an 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 proposal. In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to ensure 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.

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 operator's 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.

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.

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.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
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NFPA COMPLIANCY

Apparatus proposed by the bidder 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 proposal 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:

- 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.

GENERATOR TEST

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

CITY OF SANTA ROSA FIRE DEPARTMENT

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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 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.

COMPLIANCE WITH APPLICABLE LAWS

The apparatus will comply with all U.S. Department of Transportation, State of California Motor Vehicle Code, Air Pollution and Emission Control, apparatus meeting requirements of the California Air Pollution Control Board, and local requirements pertaining to vehicles used for firefighting, and emergency vehicles at time of contract signing.

The apparatus will also comply with all requirements as specified in NFPA (latest edition) standards. The unit is to be of current year manufacture and is to be new and unused.

LICENSED MANUFACTURER

The State of California Vehicle Code, section 11701 requires "every manufacturer of a vehicle subject to registration shall make application to the Department of Motor Vehicles (DMV) for a license containing a general distinguishing number".

The manufacturer has a current license at time of bid as outlined above and is available upon request.

LICENSED DEALERSHIP

The State of California Vehicle Code, section 11701 requires a "dealer in vehicles of a type subject to registration, shall make application to the Department of Motor Vehicles (DMV) for a license containing a general distinguishing number".

The dealership has a current license at time of bid as outlined above and is available upon request.

LICENSED SALES REPRESENTATIVE

The State of California Vehicle Code, section 11800 requires that it shall be "unlawful for any person to act as a vehicle salesperson without having first procured a license issued by the Department of Motor Vehicles (DMV)".

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
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The sales representative has a current license at time of bid as outlined above and is available upon request.

VEHICLE REGISTRATION

The State of California Vehicle Code section 11739 requires that the “dealer of a new motor vehicle sale is responsible for applying for the title, securing vehicle registration, and obtaining license plates for the purchaser” through the Department of Motor Vehicles (DMV).

Golden State Fire Apparatus Inc. will obtain the registration and license plates on behalf of the purchaser.

DEALER PREPARATION

Golden State Fire Apparatus Inc. will provide all necessary dealer preparation applicable to new equipment prior to final delivery to the purchaser which includes the following services (if applicable to the specification):

- Proposal Compliance - Inspect apparatus for compliance with proposal.
- Fluid Levels - Inspect for correct capacities of the following: engine oil, coolant, power steering fluid, washer reservoir fluid, transmission fluid, rear end fluid, pump transmission oil, and primer oil.
- Visual Inspection - Inspect tires and wheels for proper pressure and lug torquing. Tighten any loose hardware and repair reasonable paint scratches or chips. Lubricate valve rods and check doors for correct adjustment.
- Electrical Inspection - Operate all lights, sirens, and other electrical accessories.
- Road Test - Run a road test with tank full. Empty tank, drain pump, and drain all lines when above steps are completed.
- Fuel Tank - Fuel tank shall be filled to capacity prior to final delivery.
- Cleaning / Detailing - The apparatus shall be thoroughly washed and detailed at the dealership prior to final delivery to the purchaser. This includes removal of any metal shavings.

DELIVERY

Prior to delivery, the equipment / material will be completely assembled as necessary to assure proper operation and function. Apparatus, to ensure proper break in of all components while still under warranty, **shall be delivered under its own power** - rail or truck freight shall not be acceptable.

All equipment / material, spare parts and supplies shall be delivered F.O.B. destination, delivery charges prepaid and added, to:

- Santa Rosa Fire Department
- 2373 Circadian Way
- Santa Rosa, CA 95407

TRAINING/ INSTRUCTION PROGRAM

On initial delivery of the fire apparatus, Golden State Fire Apparatus will supply a qualified representative to demonstrate the apparatus and provide initial instruction to the fire department for a period of one (1) day. In addition to this, Pierce Manufacturing will provide a qualified aerial engineer to demonstrate the aerial portion of the apparatus and provide initial instruction regarding the operation, care and maintenance of the apparatus for a period of four (4) days.

CITY OF SANTA ROSA FIRE DEPARTMENT

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SERVICE FACILITY

Golden State Fire Apparatus Inc. places a high priority on service. In order to provide efficient service and support during the life of the apparatus, we maintain a Pierce authorized service and repair facility in Central and Northern California. Golden State Emergency Vehicle Service is located at 7400 Reese Road in Sacramento.

Our service center has an indoor heated facility and is located within 100 miles from the Santa Rosa Fire Department. This facility is protected by fire and security alarm systems for safe storage of the apparatus.

Our service facility maintains a complete inventory of repair and/or replacement parts, has an on-site training classroom, and owns two (2) fully equipped mobile service vehicle with the ability to carry spare parts and repair equipment.

WARRANTY PROCEEDURE

To prevent problems associated with "divided responsibility", Golden State Fire Apparatus Inc. will coordinate and submit all warranty claims on behalf of the purchaser. We will also coordinate future product recalls and upgrades (if any) to the existing apparatus. This includes coordinating repairs between the original manufacturer of the component and filing of warranty claims on behalf of the purchaser.

SERVICE AND WARRANTY SUPPORT

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 being proposed 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 operator's 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 EVT's, and offers hands-on repair and maintenance training classes multiple times a year.

AFTERMARKET SUPPORT WEBSITE

Pierceparts.com will provide Pierce authorized dealer access to comprehensive information pertaining to the maintenance and service of their customer's apparatus. This tool will provide the Pierce authorized dealer the ability to service and support their customers to the best of their ability with factory support at their fingertips.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
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Pierceparts.com is also accessible to the end user through the guest login. Limited access is available and vehicle specific parts information accessible by entering a specific VIN number. All end users should see their local authorized Pierce dealer for additional support and service.

The website will consist of the following screens at the dealer level:

My Fleet Screen

The My Fleet screen will provide access to truck detail information on the major components of the vehicle, warranty information, available vehicle photographs, vehicle drawings, sales options, applicable vehicle software downloads, etc.

Parts Screens

The Parts screens will provide parts look-up capability of Pierce Manufacturing sourced items, with the aid of digital photographs, part drawings and assembly drawings. The parts search application will permit the searching of parts by item description or function group (major system category). The parts application will provide the ability to submit electronically a parts order, parts quote, or parts return request directly to Pierce Manufacturing for processing.

Warranty Screen

The Warranty screens will provide dealers the ability to submit electronically warranty claims directly to Pierce Manufacturing for reimbursement.

My Reports Screens

The My Reports screens will provide access to multiple dealer reports to allow the dealership to maintain communication with the customer on the status of orders, claims, and phone contacts.

Technical Support Screens

The Technical Support screens will provide access to all currently published Operation and Maintenance and Service Publications. Access to Pierce Manufacturing Service Bulletins and Work Instructions, containing information on current service topics and recommendations will be provided.

Training

The Training screens will provide access to upcoming training classes offered by Pierce Manufacturing along with interactive electronic learning modules (Operators Guides) covering the operation of major vehicle components will be provided. Access to training manuals used in Pierce Manufacturing training classes will be provided.

CITY OF SANTA ROSA FIRE DEPARTMENT

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About Pierce

Access to customer service articles, corporate news, quarterly newsletters, and key contacts within the Customer Service Department will be provided. The current Customer Service Policy and Procedure Manual, detailing the operation of the Customer Service group will also be accessible.

PERFORMANCE BOND, 1 YEAR

Golden State Fire Apparatus, Inc. 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.

Golden State Fire Apparatus, Inc. 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 proposal. 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.

WEEKLY PROGRESS REPORTS

Golden State Fire Apparatus, Inc. shall provide the following:
Weekly progress reports including photographs of the apparatus or the major components as they are being constructed. The reports shall commence at the start of the manufacturing process and shall continue through production by the manufacturer. The reports shall show the progress of the apparatus through the course of each week. Special attention shall be given to show the unique features and aspects of the apparatus as construction progresses.

INSPECTION TRIPS

Golden State Fire Apparatus, Inc. will provide two (2) factory inspection trips for three (3) customer representatives on each trip. The inspection trips will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as air travel, lodging, meals and ground transportation while at the factory will be the responsibility of Golden State Fire Apparatus, Inc.

CONTINGENCY FUND

A contingency fund in the sum of \$10,000.00 (pre-tax), is included in the proposal price to cover the cost of unforeseen items or changes the customer may choose to make during the course of construction or for loose equipment and/or installation of loose equipment after the apparatus has been completed and delivered to Golden State Fire Apparatus (7400 Reese Road, Sacramento, CA) and prior to final delivery to the customer location. Any unused portion of these funds will be deducted from the final payment (if applicable) and/or reimbursed to the customer, per the direction of the City of Santa Rosa.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
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APPROVAL DRAWING

A drawing of the proposed 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.

DRAWING, COMPARTMENT LAYOUT

A basic drawing will be provided for the interior body compartments. This drawing will be provided for graphic representation only and will include such things as shelves, trays, reels, dividers, air control panels, air bottle storage bins, poly boxes, etc.

DRAWING, CAB TOP VIEW

On the sales drawing a top view of the cab seating will be provided. The top view will be a reference only of the seating in the order.

ELECTRICAL WIRING DIAGRAMS

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

ARROW XT TRACTOR CHASSIS

The Pierce Arrow XT™ 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 heavy-duty line tilt cab.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus will be 11' – 2.00".

MAXIMUM OVERALL LENGTH

The target overall length of the apparatus will be 59' - 00.00".

ANGLE OF DEPARTURE

The angle of departure will be 13 degrees. This will be effective with the truck in a unloaded state.

ANGLE OF APPROACH

The angle of approach will be 15 degrees. This will be effective with the truck in a unloaded state.

WHEELBASE

The wheelbase of the vehicle will be 160.00".

CITY OF SANTA ROSA FIRE DEPARTMENT

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GVW RATING

The gross vehicle weight rating will be 72,540 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 mainframe inverted "L" liner will be provided. It will be heat-treated steel measuring 12.00" x 3.00" x 0.25". Each liner will have a section modulus of 7.795 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 3,976,502 in-lb.

The frame liner will be mounted inside of the chassis frame rail, beginning at the front edge of the mainframe rail and extending to the rear cab cross member.

FRONT AXLE

The front axle will be a reverse "I" beam type with inclined king pins. It will be a Meritor™ axle, Model FL-943, with a rated capacity of 18,740 lb.

The turning angle will be 45 degrees or greater.

A viewing window will be provided on each side of the axle for checking the oil level.

FRONT SUSPENSION

Front springs will be a heavy-duty, taper leaf design, 54.00" long by 4.00" wide, with a ground rating of 19,000 lbs.

Kaiser spring pins will be provided with double figure-eight grease grooves and a layer of electroless nickel plating, 1.0 mil thick around the entire pin. The bushing that holds the spring pin in place will also have a grease groove.

SHOCK ABSORBERS

Koni® heavy-duty telescoping shock absorbers will be provided on the front axle.

FRONT OIL SEALS

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

FRONT TIRES

Front tires will be Goodyear 385/65R22.5 radials, 18 ply G296 MSA tread, rated for 20,050 lb maximum axle load and 68 mph maximum speed.

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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.

TURNING RADIUS REPORT

A turning radius analysis of the custom Pierce chassis that we are proposing will be included with this proposal. 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 Meritor™, Model RS-30-185, with a capacity of 31,000 lbs.

TOP SPEED OF VEHICLE

NFPA 1901, 2016 edition requires limits on the top speed of vehicles. NFPA 4.15.2 requires that the maximum top speed of fire apparatus with a GVWR over 26,000 lb will not exceed either 68 mph or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower. NFPA 4.15.3 requires that if the combined water tank and foam agent tank on the fire apparatus exceed 1250 gallons or the GVWR of the vehicle is over 50,000 lb, the maximum top speed of the apparatus will not exceed either 60 mph or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower. It is the intention of the standard to improve safety by limiting the speed of all apparatus to 68 mph, and tankers or heavy apparatus to 60 mph. By requesting an exception to this requirement, the purchasing authority is consciously choosing to operate their apparatus at speeds above the limits designated as safe speeds by the NFPA Technical Committee on Fire Department Apparatus.

The top speed of the apparatus as manufactured exceeds the NFPA requirements. Per fire department specification of a top speed that exceeds NFPA requirements, the apparatus will be non-compliant to NFPA 1901 standards at time of contract execution.

A rear axle ratio will be furnished to allow the vehicle to reach an approximate top speed of 68 MPH.

REAR SUSPENSION

Rear suspension will be a Hendrickson FMX 312 EX, air ride with a ground rating of 31,000 lb. The suspension will have the following features:

- Heavy-duty shock absorbers to protect air springs from overextension
- Heavy-duty torque rods and bushings
- Premium, heavy-duty rubber bushings require no lubrication
- Integrated stabilizer design results in greater stability
- 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).

SYNTHETIC GEAR LUBE

The rear axle will be supplied with synthetic gear lube, as recommended by the axle manufacturer.

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REAR TIRES

Rear tires will be four (4) Goodyear 315/80R22.50 radials, 18 ply "all season" Regional RHD II HCT tread, rated for 31,620 lb maximum axle load and 75 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.

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.

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 eight (8) 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.

FRONT HUB COVERS

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

HUB COVERS (TILLER AXLE)

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

HUB COVERS (REAR)

Stainless steel baby moon covers will be provided over the rear axle hubs.

LUG NUT COVERS

Stainless steel lug nut covers will be installed on all lug nuts.

MUD FLAPS

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

MUD FLAPS

Mud flaps will be installed behind the tiller trailer wheels of the apparatus.

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.

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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 Ziamatic SQCH-44-H horizontal mounting wheel chock brackets provided for the Ziamatic SAC-44-E folding wheel chocks.

The brackets will be mounted under the forward section of compartment LS7. The brackets will be mounted on an angle, with the "stop" down and opening up.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco tractor 4S4M and tiller tractor 2S2M anti-lock braking system.

The chassis ABS will provide four (4) channel anti-lock braking control on the front and rear axle. The trailer ABS will provide two (2) channel anti-lock braking control on the tiller axle.

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 particular wheel begins to lockup, a signal will be sent to the control unit. This control unit then will 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.

A tiller trailer ABS fault lamp will be provided in the tiller cab and the chassis cab.

Two (2) connectors are provided to read the diagnostics for each ABS system. The two (2) diagnostic systems communicate on different protocols requiring different diagnostics - SAEJ1587 versus J1939.

BRAKES

The service brake system will be full air type by Meritor™.

Front brakes will be Model EX225 Disc Plus, disc type with automatic pad wear adjustment and 17.00" ventilated rotors for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 8.63" cam operated with automatic slack adjusters. Dust shields cannot 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 5,198 cubic inches

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- 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.

BRAKE SYSTEM AIR DRYER

The air dryer will be WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100 watt heater.

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.

ALL WHEEL LOCK-UP

An all wheel lock-up system will be installed which applies air to the front brakes and uses the spring brake at the rear.

Front brakes will apply with the standard parking brake control.

The all wheel lock-up system will be operational only when the parking brake is applied, the truck transmission is in neutral and engine is running.

AIR TANK, SPECIAL LOCATION

Due to space constraints, four (4) air tanks will be located on the underside of the tractor chassis, per chassis engineering direction. Air tanks will not be installed inside any of the reservoir storage compartment areas.

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ENGINE

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

Make:	Cummins®
Model:	X15
Power:	600 hp at 1800 rpm
Torque:	1850 lb-ft at 1200 rpm
Governed Speed:	2100 rpm
Emissions Level:	EPA 2017
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	912 cubic inches (14.9L)
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 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.

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."

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.

ENGINE AIR INTAKE

The air intake with an ember separator will be mounted high on the passenger side of the cab, to the front of the crew cab door. The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine. The ember separator will be easily accessible through a hinged stainless steel grille, with one (1) flush quarter turn latch.

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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 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.

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 approximately 1,352 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy will 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 de-aeration 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, or Goodyear, rubber hose will be used for all engine coolant lines installed by Pierce Manufacturing.

Hose clamps will be stainless steel constant torque type to prevent coolant leakage. They will expand and contract according to coolant system temperature thereby keeping a constant clamping pressure on the hose.

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FUEL TANK

A 50 gallon fuel tank will be provided and mounted at rear of 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 .75" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the left hand side rear of the chassis on the vertical portion of the fender skirting area. The inlet will be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only".

A .50" diameter vent will be provided running from top of tank to just below fuel fill inlet.

The 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 brushed 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.

FUEL COOLER

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

FUEL FILL DOOR

A brushed stainless steel fuel fill door will be installed.

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.

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TRANSMISSION

An Allison 5th generation, model EVS 4500PR, electronic, torque converting, automatic transmission with retarder will be provided.

The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display will indicate when service is due.

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 with five (5) + one (1) "Mode" selector 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 - 4.70 to 1.00, 2nd - 2.21 to 1.00, 3rd - 1.53 to 1.00, 4th - 1.00 to 1.00, 5th - 0.76 to 1.00, 6th - 0.67 to 1.00, R - 5.55 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.

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TRANSMISSION FLUID

The transmission will be provided with TranSynd, or other Allison approved TES-295 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

A Ross, Model TAS-85, steering gear, 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 HORN BUTTON

The steering wheel 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: **SANTA**

The second row of text will be: **ROSA**

The third row of text will be: **FIRE DEPARTMENT**

BUMPER

A one piece bumper manufactured from .38" formed steel with a .38" bend radius will be provided. The bumper will be 10.00" high with a 1.50" top and bottom flange, and will be attached to front of the chassis frame. The bumper will have 45 degree corners and side plates. The steel side plates will extend to the cab face. The bumper will be metal finished and painted job color.

To provide adequate support strength, the bumper will be mounted directly to the front of the C channel frame. The frame will be a bolted modular extension frame constructed of 50,000 psi tensile steel.

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GRAVEL PAN

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

LIFT AND TOW MOUNTS WITH TOW EYES

Mounted to the frame extension will be lift and tow mounts. Incorporated in the mounts will be two (2) painted steel tow eyes. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems. The tow eyes will not be used for lifting of the apparatus.

The inner and outer edges of the tow eyes will have a 0.25" radius.

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

TOW EYES

Two (2) cutouts will be provided in the front face of the stainless steel bumper to allow two (2) Chicago style tow eyes to extend out the front. The inner and outer edges of the utility eyes will have a 0.25 radius.

The tow eyes will be designed and positioned to allow up to a 6,000 pound straight horizontal pull in line with the centerline of the vehicle. The tow eyes will not be used for lifting of the apparatus.

The utility eyes will be chrome plated.

FRONT BUMPER NOTCH

The front bumper will be notched for recessing of the Q2B siren. The notch will be designed so that the bumper is one continuous piece. The notch will be welded in place for strength with a continuous top and bottom flange. All welds will be metal finished for appearance. The siren will be located left side, outside frame, outboard of the bumper.

CAB

The Arrow XT cab will be designed specifically for the fire service and will be manufactured by the chassis builder.

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 solid A356-T5 aluminum. The B-pillar and C-pillar will 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 6.50" x 4.875" x 0.1875" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.36" thick corner casting at each of the front corners of the roof assembly.

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The front of the cab will be constructed of a 0.25" thick gusset plate, covered with a 0.090" front skin (for a total thickness of 0.34"), and reinforced with a 95.00" wide x 11.13" deep x 0.50" thick cross-cab support located just below the windshield. The cross-cab support will run the full width of the cab and weld to each A-pillar, the 0.25" thick gusset plate and the front skin.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.50" thick cross-floor support providing a total thickness of 0.6875" of structural material at the front floor area. The front floor area will also be supported with one (1) 0.50" plate bolted to one (1) 0.78" plate that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.187" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be 94.75" wide (outside door skin to outside door skin) to maintain maximum maneuverability.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 103.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 113.00". 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 floor to ceiling height inside the crew cab will be 64.00" in the center and 69.25" in the outboard positions.

The crew cab floor will measure 40.12" from rear wall to the back side of engine tunnel.

The engine tunnel, at the rearward highest point (knee level), will measure 47.75" to the back wall.

The crew cab will be of the totally enclosed design with access doors constructed in the same manner as the driver and passenger doors.

The cab will be a full tilt cab style.

A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

CAB ROOF DRIP RAIL

For enhanced protection from inclement weather, a drip rail will be furnished on the sides of the cab. The drip rail will be constructed of bright polished extruded aluminum, and be bonded to the sides of the cab. The drip rail will extend the full length of the cab roof.

INTERIOR CAB INSULATION

The cab will include 1.50" insulation in the ceiling and side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

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FENDER LINERS

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

WINDSHIELD

A curved safety glass windshield will be provided with over 2,754 square inches of clear viewing area. The cab windshield will have bright trim inserts in the rubber molding holding the glass in place. Economical windshield replacement glass will be readily available from local auto glass suppliers.

All cab glass will be tinted.

WINDSHIELD WIPERS

Two (2) electric windshield wipers with washer will be provided that meet FMVSS and SAE requirements.

The washer reservoir will be able to be filled without raising the cab.

GLOVE BOX

A glove box with a drop-down door will be installed in the front dash panel in front of the officer's position.

ENGINE TUNNEL

Engine hood side walls will be constructed of 0.50" aluminum. The top will be constructed of 0.19" aluminum and will be tapered at the top to allow for more driver and passenger elbow room.

The engine hood will be insulated for protection from heat and sound. The noise insulation keeps the dBA level within the limits stated in the current 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, dual lift cylinders, and necessary hoses and valves.

The hydraulic pump will have a manual override for backup in the event of electrical failure.

Lift controls will be located in passenger side reservoir compartment.

In addition to the panel controls, a 15' remote control will be provided for raising and lowering the cab. The remote control will be stored in the cab. The receptacle for the remote control will be located next to the master controls on the panel.

The engine will be easily accessible and capable of being removed with the cab tilted. The cab will be capable of tilting 45 degrees and 90 degrees with crane assist.

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Cab will be locked down by a 2-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located 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. The arm and cab structure will be provided with a hole to install a pin to keep the stay arm in place with the cab in the lifted position. This device will be manually stowed to its original position before the cab can be lowered.

CAB LIFT INTERLOCK

The cab lift system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the battery switch is in the on position. The cab tilt switch will be disabled if the parking brake is released or the ignition switch is turned on.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a bright finished grille surround, will be provided on the front center of the cab.

MIRRORS

A Retrac, Model 613423, dual vision, motorized, west coast style mirror, with chrome finish, will be mounted on each side of the front cab door with spring loaded retractable arms. The flat glass and convex glass will be heated and adjustable with remote control within reach of the driver.

DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 37.50" wide x 61.75" 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 34.88" wide x 71.75" 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.

A flush mounted, chrome plated paddle type door handle will be provided on the exterior of each cab door. Each door will also be provided with an interior flush paddle handle.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks as required by FMVSS 206. 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 full length, 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.

The cab steps at each door location will be located below the cab doors and will be exposed to the exterior of the cab.

DOOR PANELS

There will be a full height brushed stainless steel door panel installed on the inside of all cab doors. The cab door panels will be removable without disconnecting door and window mechanisms.

MANUAL CAB DOOR WINDOWS

All cab entry doors will contain a conventional roll down window.

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 24.75" wide, and the crew cab steps will be 21.25" 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.

FIFTH WHEEL

The fifth wheel will be designed to allow the tiller trailer to pivot fore & aft and be rotated. The fifth wheel will also be capable of full operation up to a 14 degree break over angle.

A fifth wheel lockout system will be provided to limit motion during aerial operations.

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The fifth wheel lockout system, when activated, will prevent movement between the upper and lower plates of the fifth wheel assembly.

In the normal road travel condition the cylinder mounted solenoid valves will be open and will allow transfer of oil between the front and rear pair of cylinders.

When the stabilizers are in their proper supporting position and as the aerial leaves the boom support, the solenoid valves will close.

The closed valves will allow no oil to be transferred and the fifth wheel assembly will become rigid.

A fill and a gauge port will be provided on the top of the trailer goose neck for maintenance.

FENDER PANELS

The chassis behind the cab will be assembled with fender panels over the wheels, running boards and steps for access to the turntable and decking over the frame rails.

The fender panels will be fabricated of .125"-5052 aluminum with a 38,000 psi tensile strength.

Fender design will be provided for prevention of rust pockets and ease of maintenance.

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.

A dielectric barrier will be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

The area over the frame rails between the cab and fifth wheel will be covered with aluminum treadplate to serve as a walkway area.

The walkway area will be properly reinforced with a steel substructure attached to the frame rails.

Running boards will be installed on each side directly behind the cab for access to the walkway area behind the cab and the turntable.

The running boards will be covered with aluminum treadplate.

WEBBED GRAB HANDLE INTERIOR CREWCAB DOORS

Installed on the interior of each crew cab door stop strap will be a red webbed grab handle. The grab handles will be securely mounted.

WEBBED GRAB HANDLE ON INTERIOR CAB DOORS

Installed on the interior of the driver and officer cab door stop strap will be a red webbed grab handle. The grab handles will be securely mounted.

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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 16.50" wide x 21.88" high.

WINDOW TINT

- The upper window in the left side crew cab door will be tinted privacy dark gray.
- The rollup window in the left side crew cab door will be tinted privacy dark gray.
- The upper window in the right side crew cab door will be tinted privacy dark gray.
- The window behind the left side front cab door will be tinted privacy dark gray.
- The window behind the right side front cab door will be tinted privacy dark gray.
- The rollup window in the right side crew cab door will be tinted privacy dark gray.

COAT HOOK(S), HEAVY DUTY

There will be three (3) coat hooks supplied and installed at locations to be determined at the pre-construction conference. These hooks will be for coat storage only.

The hook(s) will be sprayed with black Line-X® polyurethane/polyurea elastomer abrasive resistant material.

EQUIPMENT MOUNTING SHELF

There will be one (1) shelf for permanent mounting of equipment provided.

The shelf will be located on the right side in the crew cab, mounted to the side of the engine cover to outside crew cab wall.

The shelf will be supported by cross bracing to keep the area under the shelf open. The shelf will be 26.50" long front to back and as wide as space allows from side to side. Shelf will extend from the front edge of the air tunnel on the passenger's side to the front edge of the crew cab door opening.

Each shelf will have a 4.00" lip around edge.

On the front inboard side of the shelf, in front of the engine tunnel blister, will be a cup holder. The cup holder will match the height of the shelf.

Each shelf will be fabricated from 0.188" aluminum and will be painted to match the cab interior.

COMPUTER MOUNTING

There will be one (1) computer installation provision(s) installed in a location to be determined at the construction review inspection.

The tray will be constructed of stainless steel. The tray will be supplied with two (2) straps over the top connected to footman loops. These straps will secure the computer in place during travel. The slides on the tray will have a lock feature so the tray can be locked in either the extended or stowed position.

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CAB INTERIOR

The left and right side dash and center console will be a flat faced design to provide easy maintenance and will be constructed out of painted aluminum.

The engine tunnel will be padded and covered with leather grain vinyl resistant to oil, grease and mildew. The right side of the engine tunnel cover next to the officer seat will be raised 3.00" to allow for movement of the seat without touching the cover.

For durability and ease of maintenance, the cab interior side walls will be painted aluminum. The rear wall will be painted aluminum.

The headliner will be installed in both forward and rear cab sections. Headliner material will be vinyl. A sound barrier will be part of its composition. Material will be installed on aluminum sheet and securely fastened to interior cab ceiling.

Forward portion of cab headliner will provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be 36 oz dark silver gray vinyl.

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 fire smoke 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

There will be a 41,000 BTU defroster in the cab located under the engine tunnel.

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 have a 3-speed blower and temperature controls accessible to the driver and officer.

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The defroster ducts will be designed to provide maximum defrosting capabilities for the front cab windows.

CAB/CREW CAB HEATER

Two (2) auxiliary heaters with 32,000 BTU each will be provided in the cab. The heaters will have a 3-speed blower and temperature controls accessible to the driver and officer. There will also be louvers located below the rear facing seat riser and below the driver and officer positions for airflow.

The heaters will be mounted, one (1) within each rear facing seat riser.

AIR CONDITIONING

A high-performance, customized air conditioning system will be furnished inside the cab and crew cab. 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 72 degrees Fahrenheit 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 that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover and mounting legs to be painted to match the cab roof.

An evaporator unit that meets and exceeds the performance specification will be installed in the cab, located in the center 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 be provided with adjustable air outlets strategically located to direct air flow to the driver, officer and crew cab area.

All hose used will be class 1 type to reduce moisture ingress into the air conditioning system.

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

The air conditioner will be controlled by a single electronic control panel. For ease of operation, 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.

HEPA FILTER

The filter for both the air conditioner and the defroster will be high efficiency particulate air filters.

SUN VISORS

There will be two (2) vinyl covered 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 a polished stainless steel bracket provided to help secure each sun visor in the stowed position.

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GRAB HANDLE

A black rubber covered grab handle will be mounted on the lower portion of the driver's side cab entrance to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and steering wheel column.

A black rubber covered grab handle will be mounted on the passenger's side door post, above the instrument panel.

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 engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling.

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



MAP BOX

There will be one (1) map box(es) with three (3) bins, open at top. The map box(es) will be installed at final inspection. The map box(es) will be divided into three (3) bins, each being 12.50" wide x 3.00" high x 12.00" deep. Each bin will slant 30 degrees from horizontal. The map box(es) will be constructed of 0.125" aluminum and will be painted to match the cab interior.

There will be one (1) strap(s) with 1.00" side release type fasteners provided for the specified map box.

SEATING CAPACITY

The seating capacity in the cab will be five (5).

DRIVER SEAT

A USSC, Model Magnus R-Back, air suspension seat will be provided in the cab for the driver. For increased convenience, the seat will include a manual control to adjust the height (3.00" travel) and horizontal position (6.00" travel). To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 90 degrees to 45 degrees rearward. 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 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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There will be no additional contaminant mitigation vinyl covers shipped loose with the seat.

OFFICER SEAT

A USSC Valor P1A, air suspension seat will be provided in the cab for the officer. For increased convenience, the seat will include slides to allow for 4.00" of fore/aft travel. To provide flexibility for multiple configurations, the seat will have a reclining back. 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 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 DRIVER SIDE OUTBOARD SEAT

There will be one (1) rear facing, USSC Valor R-back seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep cushion with an adjustable recline back. To ensure safe operation, the seat will be equipped with a sensor in the seat cushion and belt receptacle that will activate an alarm indicating the seat is occupied but not buckled.

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, USSC Valor, R-back seats provided at the center position in the crew cab. An additional 8.00" of spacing will be provided above standard to provide more room for each occupant. For optimal comfort, the seats will be provided with 17.00" deep cushions and an adjustable recline back. An arm rest will be provided on both sides of each seat.

To ensure safe operation, the seats will be equipped with a sensor in the seat cushion and belt receptacle that will activate an alarm indicating the seat is occupied but not buckled.

The seats will be furnished with a 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 seat upholstery will be 46 ounce leather grain gray vinyl resistant to oil, grease and mildew. The cab will have five (5) seating positions.

ACCESS DOORS

An access door will be provided on both sides of the forward facing seat riser in crew cab in addition to the standard front access door. Doors will be constructed out of same material as seat riser with one (1) 1/4 turn flush latch on each door.

FORWARD FACING SEAT RISER

The forward facing seat riser in the crew cab will be raised up 3.00".

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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.

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) Whelen, Model 60C*EGCS, 6.00" round dual LED dome lights 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 lens switch and the door switch to activate the white LEDs adjacent to the respective door.

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

CAB SPOTLIGHT

There will be one (1) Golight/RadioRay®, Model 20**4, white LED spotlight located on the cab roof, on the cab roof, centered behind the lightbar. The spotlight will be mounted on a painted pedestal.

This light may be load managed when the parking brake is applied.

SPOTLIGHT CONTROLLER

There will be two (2) wired dash mounted remotes provided for the spotlight.

Controllers will be mounted in a switch panel. Controller will be located on the far right side of the switch panel and the left side of the switch panel will be locations for two rocker switches.

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SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlight will be located within reach of the driver and officer.

HAND HELD LIGHT

There will be four (4) 12v Streamlight, Model #44401, Fire Vulcan, lights mounted one on outboard officers seat riser; two on rear cab wall (6" above floor), one outboard of PS forward facing seat and one outboard DS forward facing seat; one in upper rear wall P1 compartment. See flashlight layout drawing in E-folder for reference.

Each light housing will be orange in color and be provided with a single filament halogen bulb and two "ultra bright blue taillight LEDs" The LEDs will have a dual mode (blinking or steady).

HAND HELD LIGHT

There will be Streamlight, Model UltraStinger™ lights provided. Each light will include an AC/DC charger. There will be four (4) lights provided.

The flashlights will be mounted at locations to be determined at the pre-construction conference.

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.

CAB INTERIOR

The wrap-around style high impact ABS plastic cab dash fascia will be designed to provide 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.

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

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- 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
 - 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
- 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)

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- 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

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 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.

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

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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 three (3) 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 three (3) switch panels in the overhead console on the officer's side and up to three (3) switch panels in the engine tunnel rear facing console accessible to both driver and 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 odometer, trip mileage, PTO hours, fuel consumption, engine hours, and other configuration specific information. 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.

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"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
- 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 up to six (6) rocker-type switches each rated for two hundred thousand (200,000) cycles. Panels with less than six (6) switches will include indicators or blanks. The switch panel(s) will be located in the "overhead" position above the windshield on the driver side overhead to allow for easy access.

The switches will be rocker-type and include an integral indicator light. For quick, visual indication the switch will be illuminated whenever the switch is active. A 2-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed below the switches. The label will allow light to pass through the letters for improved visibility in low light conditions. Switches and light source are integral to the switch panel assembly.

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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.

HOURMETER - 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.

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 inside the tiller cab, on the dash, on the left side. See instrument panel layout for additional reference.
- 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 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 daisy chain for three (3) on rear cab wall (6" above floor), two on PS next to forward facing seat, one on DS next to forward facing seat.
- 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.

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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 switched power
- The negative wire will be connected to ground
- Wires will be protected to 30 amps at 12 volts DC
- Power and ground will terminate behind the drivers seat, on the inside cab wall, six inches up from the floor
- Termination will be with a 10-place bus bar with screws and removable 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 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 officer side dash area
- 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 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 in switch panel #9. See instrument panel layout for additional reference
- Termination will be with 15 amp, power point plug with rubber cover
- Wires will be sized to 125 percent of the protection

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

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SPARE CIRCUIT

There will be two (2) dual USB fast charge socket mounts 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 4.8 amps at 12 volts DC.
- The USB socket mount will be one (1) in switch panel #9. One (1) in the tiller cab, dash area, right side. See instrument panel layout for additional reference.
- Termination will be a Blue Sea Systems part number 1045 dual USB charger socket.
- Wires will be sized to 125% of the protection.

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

RADIO WITH CD PLAYER

There will be one (1) Alpine UTE-62BT, Digital Media Receiver installed per switch panel layout.

The receiver will include;

- digital media receiver with AM/FM tuner (does not play CDs)
- built-in MOSFET amplifier (18 watts RMS CEA-2006/50 peak x 4 channels)
- variable color illumination
- built-in Bluetooth for hands-free calls and music streaming
- variable color display
- plays MP3, WMA, and FLAC music files through USB
- compatible with iPod, iPhone, and Android
- Alpine Tunelt App allows for extensive sound adjustment
- App Mode for metadata display and basic control of select music apps

There will be one (1) Alpine KTP-445, 45 watts RMSx2 to 4ohm Power Pack mounted in a location to be determined at the pre-construction conference.

There will be four (4) Polk DB652, 6-1/2" 2-way speakers with spacers, mounted in the ceiling headliner, one (1) behind the driver seat, one (1) behind the officer seat and two (2) in the crew cab area; each outboard of the forward facing seats.

There will be a roof-mounted rubber antenna located in an open space, on the cab roof.

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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:

- 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

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- 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
- 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.
 - The screen will indicate if a load has been shed (disabled) or not shed.
 - "At a glance" color features are utilized on this screen.

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- 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
 - Pressure Controller (if equipped)
 - Generator Frequency (if equipped)
- Live Data
 - General Truck Data
- Maintenance
 - Engine oil and filter
 - Transmission oil and filter
 - 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
- 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

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- Rear Body Door(s)
- 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:

- 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

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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.

INTERCOM SYSTEM

A six (6) position David Clark, Model U3800, intercom system with single radio interface at the driver and officer, operator positions shall be provided. Three (3) crew cab positions located at two (2) forward facing seats and one (1) rear facing seat, and tiller cab, shall have intercom only.

The following components shall be supplied with this system:

- One (1) U3805 Radio Cord Junction Module
- Two (2) U3815 Radio Interface Modules (Driver, Officer)
- One (1) Remote Push To Transmit kit (Officer)
- One (1) U3801 Radio Interface Module (Tiller Cab)
- One (1) U3800 Master Station (1 Crew)
- Two (2) U3802 Headset Intercom Stations (2 Crew)
- One (1) C3820 Power Cable
- All necessary cables and connectors

RADIO / INTERCOM INTERFACE INCLUDED

All radio interfaced stations will have universal radio interfaces installed. The interface wiring will be routed within the cab to the officer overhead.

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OVER THE HEAD HEADSET

There will be five (5) over the head, headset(s) provided each seating position.

Each David Clark, Model H3432, headset will feature:

- 5' Coiled cord
- Noise cancelling electric microphone
- Flexible microphone boom rotates 200 degrees for left or right dress
- Microphone on/off button
- Comfort Gel Earseals
- 23 dB noise reduction



HEADSET HANGERS

There will be six (6) headset hanger(s) installed at locations to be determined at the construction review inspection. The hanger(s) will meet NFPA 1901, Section 14.1.11, requirement for equipment mounting.

BRACKET, JOHNNY RAY

There will be one (1) Johnny Ray, radio swivel bracket rated for 7 lbs. and will be provided and installed at a location to be determined at the pre-construction conference.

TWO WAY RADIO INSTALLATION

There will be one (1) customer supplied two way radio(s) sent to the apparatus manufacturers preferred radio installer to be installed at a location to be determined at the pre-construction conference per the shipping document.

No antenna mount or whip will be included in this option.

Specific radio shipping requirements will be followed.

PORTABLE RADIO CHARGER INSTALLATION

There will be four (4) customer supplied portable two-way radio chargers(s) sent to the apparatus manufacturers preferred radio installer to be installed at a location to be determined at the pre-construction conference. Specific shipping requirements will be followed.

TWO-WAY RADIO CABLE INSTALLATION

There will be one (1) customer supplied two-way radio remote head cable(s) sent to the apparatus manufacturers preferred radio installer for installation. The cable will be run at a location to be determined at the pre-construction conference.

Specific shipping requirements will be followed.

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BRACKET ONLY INSTALLATION

There shall be one (1) customer supplied Thermal Imaging camera charging bracket(s) sent to the apparatus manufacturers preferred installer to be installed at a location to be determined at the pre-construction conference.

Specific shipping requirements will be followed.

KNOX-BOX®

There will be one (1) Knox-Box MedVault 2, surface mount with Ethernet cable will be sent to the apparatus manufacturers preferred installer and installed in the at a location to be determined at the pre-construction conference .

A "technician's key" will be provided by the customer for each Knox Box. The box cannot be installed without a compatible technician's key.

Specific shipping requirements will be followed.

TWO WAY RADIO SPEAKER INSTALLATION

There will be one (1) customer supplied two way radio speakers sent to the apparatus manufacturers preferred third party installer to be installed at a location to be determined at the pre-construction conference.

Specific shipping requirements will be followed.

MULTI-MODE ANTENNA MOUNT

One (1) Panorama Antenna Solution Tri-Band P25, multi-mode antenna will be provided and mounted in a location to be determined at the pre-construction conference.

RADIO ANTENNA MOUNT

There will be one (1) standard 1.125", 18 thread, NMO type antenna mounting base(s) installed on the cab roof, centered and just forward of the roof transition to the raised roof on the cab roof with high efficiency, low loss, coaxial cable(s) routed within the cab / crew area to behind the drivers seat . A weatherproof cap will be installed on the mount.

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.

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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
- 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.

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.

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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
- 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 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.

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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

Six (6) 12 volt, Exide, Model 31A950X1W, group 31 batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Rating of 5700 CCA at 0 degrees Fahrenheit
- 1140 minutes of reserve capacity
- SAE Posts

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.

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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

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 painted 0.188" stainless steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The battery hold-downs will be of a non-corrosive material. All bolts and nuts will be stainless steel.

The compartments will include formed fit heavy duty roto-molded polyethylene battery trays with drain tubes for the batteries to sit in.

Heavy-duty battery cables will be used to provide maximum power to the electrical system. Cables will be color-coded.

Battery terminal connections will be coated with anti-corrosion compound. Battery solenoid terminal connections will be encapsulated with semi-permanent rubberized compound.

JUMPER STUDS

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

BATTERY CHARGER/ AIR COMPRESSOR

A Kussmaul Pump Plus 1200, Model 091-9-1200, single output battery charger/air compressor system will be provided. A Kussmaul, Model 091-194-IND, auto charge status center indicating the state of charge will be included.

The automatic charger will maintain one (1) set of batteries with a maximum output current of 40 amps.

The 12-volt air compressor will be installed to maintain the air system pressure when the vehicle is not in use.

There will be an auto pump timer installed between the pressure switch and the pump that will allow the pump to run for one hour than shut down for one hour.

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

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The battery charger will be located in the crew cab forward facing seat riser box; located on the drivers side in an area so it is easily accessible.

The battery charger indicator will be located behind the driver's door on the outside of the cab.

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 red 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.

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 of cab, above wheel.

JUMPER STUDS

There shall be one (1) set of jumper studs shall be provided on the lowest point of the driver side battery box; facing outboard.

ALTERNATOR

A Delco Remy®, Model 55SI, alternator will be provided. It will have a rated output current of 430 amps, as measured by SAE method J56. The alternator will feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

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.

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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 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)

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HEADLIGHTS

There will be four (4) JW Speaker®, Model 8800, 4" x 6" rectangular LED lights with heated lens mounted in the front quad style, chrome housing on each side of the cab grille:

- the outside light on each side will contain a part number 055***1 low beam module
- the inside light on each side will contain a part number 055***1 high beam module
- the headlight to include chrome bezels

The low beam lights will be activated when the headlight switch is on.

The high beam and low beam lights will be activated when the headlight switch and the high beam switch is activated.

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 LIGHT

There will be two (2) Whelen, Model M6T, amber LED arrow directional lights provided on the exterior rear wall of compartments D7 and P7.

Each light will be surface mounted in a 15 degree angle bracket.

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

The front identification and clearance lights will be included in the front visor scene light.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Truck-Lite®, Model 33050R, LED lights used as identification lights recessed and 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

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There will be two (2) Truck-Lite, Model 33050R, LED lights recessed 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 33050R, LED lights recessed 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.

FRONT CAB SIDE DIRECTIONAL/MARKER LIGHTS

There will be two (2) Truck-Lite®, Model 19036Y, amber LED lights installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

The lights will activate as marker lights with the headlight switch and directional lights with the corresponding directional circuit.

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.

The lights will be mounted in a polished combination housing.

There will be two (2) Whelen Model M6BUW, LED backup lights provided in the tail light housing.

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LICENSE PLATE BRACKET

There will be one (1) license plate bracket mounted on the rear of the body.

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.

LIGHTING BEZEL

There will be two (2) Whelen, Model M6FCV4P, four (4) place chromed ABS housings with Pierce logos provided for the rear M6 series stop/tail, directional, back up, scene lights or warning lights.

STOP LIGHT (ADDITIONAL)

There will be one (1) Whelen, Model PSR00XRR, LED stop light provided at the rear of the body as the third brake light. The light will be mounted on the rear of the tiller cab, below the scene light.

BACK-UP ALARM

An ECCO model 505, solid state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute at a constant 87db.

WARNING LIGHT FLASH PATTERN

The flash pattern of all the exterior warning lights will be set to meet the certified California, Title XIII flash pattern by either the light manufacturer's default flash pattern or by a conversion change to the certified flash pattern.

MARKER LIGHTS

There will be two (2) pairs of Weldon, Model: 9186-1500-10 or 9186-1500-20, LED marker lights installed on this apparatus, one (1) light each side per the quantity selected.

These lights will be activated with the headlight switch.

These lights will be located one (1) each side of the upper, outer trailer body edge, centered on the trailer axle and mounted in the stainless mounting brackets and one (1) on the top of the rear of the body (next to the tiller cab doors); exact location to be determined. These lights will be installed into the with metal flanges to protect them from most damage.

Amber lights will be used except for the rear most light at the rear of the apparatus which will be red.

There will be two (2) pair light mounting bracket(s) provided on the apparatus. Each flange will be made from stainless steel material and provide an area for a light to be mounted. It will be completely enclosed so the light will not be damaged from the back. The mounting will mount on the on the upper, outer trailer body edge, centered on the trailer axle.

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CAB PERIMETER SCENE LIGHTS

There will be four (4) Amdor, Model AY-LB-12HW020, 350 lumens each, 20.00" white LED strip lights provided, one (1) for each cab door.

These lights will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body perimeter scene lights.

PERIMETER SCENE LIGHTS, BODY

There will be four (4) Amdor LED lights with brackets provided.

The lights will be mounted in the following locations:

- One (1) Model AY-LB-12HW020, 350 lumens, 20.00" long light will be provided under the driver's side turntable access steps.
- One (1) Model AY-LB-12HW020, 350 lumens, 20.00" long light will be provided under the driver's side tiller cab access steps.
- One (1) Model AY-LB-12HW020, 350 lumens, 20.00" long light will be provided under the passenger's side tiller cab access steps.
- One (1) Model AY-LB-12HW012, 190 lumens, 12.00" long light will be provided under the passenger's side turntable access steps.

The perimeter scene lights will be activated (when the battery switch is on) by the following:

- a switch within reach of the driver
- the parking brake is applied
- a switch within reach of the tiller driver

ADDITIONAL PERIMETER LIGHTS

There will be four (4) lights - Amdor® Model AY-LB-12HW020, 350 lumens, 20.00" long, with white LED's installed with one (1) light under compartment D3, one (1) light under compartment P3, one (1) light under compartment D6 and one (1) light under compartment P6.

With the chassis battery switch energized, the lights will be activated by the same means as the body perimeter lights.

STEP LIGHTS

There will be a total of sixteen (16) white LED step lights provided for access to the tiller cab and turntable.

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 activated with the battery switch is on and the parking brake is applied.

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

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SIDE SCENE LIGHTS

There will be one (1) pair of Zico, Model ZQL-SS-H7614, scene lights installed forward section of the tiller trailer wheel well panel, one (1) on each side.

The lights will be controlled by a switch in the tiller cab.

SCENE LIGHTS

There will be one (1) pair of Whelen, Model M6ZC LED scene lights installed on the rear exterior wall of the tractor cab with chrome flanges.

The lights will be controlled by the aerial master switch.

12 VOLT LIGHTING

There will be one (1) Whelen, Model PCPSM1*, 12 volt surface mounted LED combination spot/flood light(s) located on the driver's side of cab, behind the crew cab door, as high as possible. The lights will be mounted with chrome flange(s).

The light(s) selected above will be controlled by the following:

- a switch at the driver's side switch panel

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

12 VOLT LIGHTING

There will be one (1) Whelen, Model PCPSM1*, 12 volt surface mounted LED combination spot/flood light(s) located on the passenger side of the cab, behind the crew cab door, as high as possible. The lights will be mounted with chrome flange(s).

The light(s) selected above will be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel

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

12 VOLT LIGHTING

There will be one (1) Whelen, Model PCPSM1*, 12 volt surface mounted LED combination spot/flood light(s) located on the rear wall of the tiller cab. The lights will be mounted with chrome flange(s).

The light(s) selected above will be controlled by the following:

- a switch at the rear of apparatus on the driver's side
- a switch at the driver's side switch panel
- a switch in the tiller cab

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

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CENTERING LIGHT

A collapsible centering light will be provided on the crew cab roof. The light will be a "boat" type light mast which will be approximately 6.00" tall. The light will be mounted at the center rear of the crew cab and will be used by the tillerman to center the tiller trailer on the chassis. The light will be wired to the headlight switch.

12 VOLT LIGHTING

There will be a Whelen® Model S72M**, 72.00" long 32,400 lumens DC powered light provided on the front cab roof as far forward as practical. The painted parts of this light assembly to be white.

The light will include the following:

- White scene LEDs
- Two (2) amber LED modules as clearance lights
- Three (3) amber LED modules as identification lights
- Four (4) additional LED modules. The additional additional modules to be four (4) scene light modules with white LEDs

The clearance and identification LEDs will be activated with the headlight switch.

The scene LEDs will be activated when the battery switch is on and by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel is on.

There will be a switch in the cab on the switch panel to control the flashing or spot LED modules.

Amber flashing LED modules will be deactivated when the parking brake is released.

The white scene and flashing LED modules may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will be three (3) Whelen® Model S30M**, 12,960 lumens 30.00" 12 volt DC light(s) with white LEDs provided on the left side of the body located, one (1) above LS2 (rearward), one (1) above LS4 (centered) and one (1) above LS6 (forward). The painted parts of this light assembly to be white.

The light(s) will include the following:

- Six (6) scene light modules with white LEDs
- Two (2) additional LED modules. The additional modules to be two (2) scene light modules with white LEDs.

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The lights will be activated per the following:

- The scene LEDs will be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel, by a switch in the tiller cab and by a switch located next to the breaker panel.
- There will be a switch in the cab on the switch panel to control the flashing or spot LED modules.
- The light(s) may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will be three (3) Whelen® Model S30M**, 12,960 lumens 30.00" 12 volt DC light(s) with white LEDs provided on the right side of the body located, one (1) above RS2 (rearward), one (1) above RS4 (centered) and one (1) above RS6 (forward). The painted parts of this light assembly to be white.

The light(s) will include the following:

- Six (6) scene light modules with white LEDs
- Two (2) additional LED modules. The additional modules to be two (2) scene light modules with white LEDs.

The lights will be activated per the following:

- The scene LEDs will be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel, by a switch in the tiller cab and by a switch located next to the breaker panel.
- There will be a switch in the cab on the switch panel to control the flashing or spot LED modules.
- The light(s) may be load managed when the parking brake is applied.

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.

SMOOTH ALUMINUM REAR WALL

The rear wall will be smooth aluminum.

TOW EYES

Two (2) rear painted 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.

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MOUNTING FOR TRAFFIC CONES

Mounting will be provided for traffic cones on the left side catwalk, above the trailer wheelwell, just forward of the M6 side zone warning light . Mounting will consist of a vertical post with treadplate fins and a formed aluminum treadplate base to hold the cones. The base will have sides on its right, left and rear. The front of the tray will be flanged down. Any edges of the tray will be rounded and smoothed. The mounting will be provided for cones that are size to be determined at the pre-construction conference (quantity will be seven) in dimensions.

COMPARTMENTATION

Body and compartments will be fabricated of .125", 5052-H32 aluminum.

Side compartments will be an integral assembly with the rear fenders.

Circular fender liners will be provided for prevention of rust pockets and ease of maintenance.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip.

The 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 or formed bright aluminum treadplate.

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.

All screws and bolts which protrude into a compartment will have acorn nuts on the ends to prevent injury.

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 lbs. equipment rating for each lower compartment of the body.

The compartmentation 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.

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.

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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.

TRACTOR RESERVOIR COMPARTMENT

A compartment will be provided ahead of the tractor fifth wheel.

The compartment on the left side will be approximately 30.00" wide x 37.75" high x 24.00" deep with a door opening of approximately 25.50" wide x 31.25" high.

The compartment on the right side will be approximately 30.00" wide x 36.75" high x 24.00" deep. The door opening will be approximately 25.50" wide x 30.25" high. The floor of this compartment will be raised 1.00" to allow for proper clearance from exhaust components.

The transverse section will be approximately 19.38" wide x 15.50" high.

The compartment will be fabricated out of smooth aluminum and painted job color. Bright aluminum treadplate will be provided on the top of the compartment.

There will be an LED light strip provided to illuminate this compartment.

An additional compartment module will be provided forward of the reservoir compartment for storage of miscellaneous equipment. The compartment will be divided into an upper and lower section.

The overall dimensions of the compartment module will be approximately 11.00" wide x 73.50" high x 96.00" deep.

The interior dimensions of the lower compartment on the left side will be approximately 11.00" wide x 42.75" high x 9.13" deep in the lower section and transverse in the upper 26.88" of height with a door opening of 8.75" wide x 41.75" high.

The interior dimensions of the lower compartment on the right side will be approximately 11.00" wide x 41.75" high x 9.13" deep in the lower section and transverse in the upper 26.88" of height with a door opening if 8.75" wide x 40.75" high. The floor of this compartment will be raised 1.00" to allow for proper clearance from exhaust components.

The interior dimensions of the upper compartment on both sides will be approximately 11.00" wide x 26.50" high and be transverse with a door opening of approximately 8.75" wide x 25.38" high.

The compartment module will be enclosed by one (1) single pan door, fabricated from smooth aluminum and painted job color. One (1) D-ring latch will be provided in the center. There will be a full height rod on the inside of the door that secures the top and bottom of the compartment. The rod will be enclosed.

Bright aluminum treadplate will be provided on the top of the compartment module.

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There will be two (2) LED strip lights mounted on the forward wall, one each side of the apparatus to illuminate this compartment.

LEFT SIDE COMPARTMENTATION

Left side compartmentation will consist of the following:

Two (2) compartments will be provided in the front body section on the left side. Each compartment will be full-height.

The forward compartment will be 47.13" wide x 55.63" high x 24.50" deep with a door opening of 40.00" wide x 51.00" high.

The rear compartment will be 44.50" wide x 55.63" high x 24.50" deep with a door opening of 40.00" wide x 51.00" high.

The upper 38.75" of each compartment will be transverse to the right side front compartmentation.

Both compartments will have lap doors.

Two (2) compartments will be provided in the center body section on the left side. Each compartment will be full-height.

The forward compartment will be 47.13" wide x 55.63" high x 24.50" deep with a door opening of 40.00" wide x 51.00" high.

The upper 38.75" of the forward compartment will be transverse to the right side front compartmentation.

The rear compartment will be 44.50" wide x 55.63" high x 24.50" deep with a door opening of 40.00" wide x 51.00" high.

Both compartments will have lap doors.

Two (2) compartments will be provided in the rear body section on the driver side.

The forward compartment will be 69.00" wide x 49.50" high x 24.50" deep in the lower 24.00" of the compartment with the remaining upper portion being 12.00" deep. The clear door opening will be 64.50" wide x 43.88" high. This compartment will be located ahead of the rear wheels and will have vertically hinged double lap doors.

The rearward compartment will be 49.00" wide x 47.50" high x 21.25" deep in the lower 22.00" of the compartment and 12.00" deep in the remaining upper area. The door opening will be 44.50" wide x 42.87" high. This compartment will be located behind the rear wheels. This compartment will have a vertically hinged double lap door. The floor of this compartment will be raised 2.00" to increase the angle of departure.

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RIGHT SIDE COMPARTMENTATION

Right side compartmentation will consist of the following:

Two (2) compartments will be provided in the front body section on the right side. Each compartment will be full-height.

The forward compartment will be 47.13" wide x 55.63" high x 24.50" deep with a door opening of 40.00" wide x 51.00" high.

The rear compartment will be 44.50" wide x 55.63" high x 24.50" deep with a door opening of 40.00" wide x 51.00" high.

The upper 38.75" of each compartment will be transverse to the left side front compartmentation.

Both compartments will have lap doors.

Two (2) compartments will be provided in the center body section on the passenger side. Each compartment will be full-height.

The forward compartment will be approximately 47.13" wide x 55.63" high x 24.50" deep with a door opening of 40.00" wide x 51.00" high.

The upper 38.75" of the forward compartment will be transverse to the drivers side front compartmentation.

The rear compartment will be approximately 44.50" wide x 55.63" high x 24.50" deep in the lower 24.00" of height. The remaining upper portion will be blistered to allow for additional ground ladder storage and will be approximately 11.00" deep. The compartment will have a door opening of 40.00" wide x 51.00" high.

Both compartments will have lap doors.

Two (2) compartments will be provided in the rear body section on the passenger side.

The forward compartment will be 69.00" wide x 49.50" high x 24.50" deep in the lower 24.00" of the compartment with the remaining upper portion being 12.00" deep. The clear door opening will be 64.50" wide x 43.88" high. This compartment will be located ahead of the rear wheels and will have vertically hinged double lap doors.

The rearward compartment will be 49.00" wide x 47.50" high x 21.25" deep in the lower 20.00" of the compartment and 12.00" deep in the remaining upper area. The door opening will be 44.50" wide x 42.87" high. This compartment will be located behind the rear wheels. This compartment will have a vertically hinged double lap door. The floor of this compartment will be raised 2.00" to increase the angle of departure.

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SIDE COMPARTMENT DOORS

All hinged compartment doors will be lap style with double panel construction and fabricated of .09" 5052H32 aluminum. Doors will be a minimum of 1.50" thick. To provide additional door strength, a "C" section reinforcement will be installed between the outer and interior panels.

Doors will be provided with a closed cell rubber gasket around the surface that laps onto the body. A second heavy-duty automotive rubber molding with a hollow core will be installed on the door framing that seals onto the interior panel, to ensure a weather resisting compartment.

All compartment doors will have polished stainless steel continuous hinge with a pin diameter of .25", that is bolted or screwed on with stainless steel fasteners. A dielectric substance will be applied to each hinge fastener.

All door lock mechanisms will be fully enclosed within the door panels to prevent fouling of the lock in the event equipment inside shifts into the lock area.

Doors will be latched with recessed, polished stainless steel "D" ring handles and Eberhard 106 locks.

To prevent corrosion caused by dissimilar metals, compartment door handles will not be attached to outer door panel with screws. A rubber gasket will be provided between the "D" ring handle and the door.

RELEASE HANDLE ON FREE DOORS

The release handle for the free door on LS1, LS2, LS3, LS4, LS5, LS6, RS1, RS2, RS3, RS4, RS5 and RS6 compartment door(s) will be located at the top of the doors. There will be a total of 12 compartment doors release handles specially located.

PULL STRAP, DOORS

One (1) compartment door will be provided with 10.00" long pull straps and installed on the B1/ ladder storage compartment door.

DOOR FRAME SCUFFPLATE

Seventeen (17) scuffplates will be provided for the lower door frame(s) for all compartments. Each scuffplate will be brushed stainless steel with a .38" lip down.

SCUFFPLATE ON INTERIOR OF COMPARTMENT DOOR(S)

The one (1) compartment door will include a brushed stainless steel scuffplate to cover the entire width and height on the inside panel of each door pan.

Scuffplate will be located R1.

SCUFFPLATE, INSIDE DOOR PAN

Ten (10) compartment doors will include a brushed stainless steel scuffplate to cover the lower portion of the inside door pan of each door. Each scuffplate will be 8.00" high and full-width of the compartment door pan.

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Scuffplate locations will be determined at the pre-construction conference.

COMPARTMENT LIGHTING

There will be 14 compartment(s) with two (2) white 12 volt DC LED compartment light strips. The dual light strips will be centered vertically along each side of the door framing. There will be two (2) light strips per compartment. The dual light strips will be in compartment(s): LS1, LS2, LS3, LS4, LS5, LS6, LS7, RS1, RS2, RS3, RS4, RS5, RS6, RS7.

Any remaining compartments without light strips will have a 6.00" diameter Truck-Lite, Model: 79384 light. 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 eight (8) sets of tracks for mounting shelf(s) in LS1, LS2, LS3, LS8, RS1, RS2, RS3 and RS8. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be unpainted with a natural finish.

ADJUSTABLE SHELVES

There will be three (3) shelves provided. The shelf construction will consist of .188" D/A sanded aluminum with 2.00" sides. Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track. The shelf will be full width x 2.00" reduced depth at the front of the shelf (between shelf and interior door surface) in size.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The location will be in compartments: LS1, RS1 and RS3.

ADJUSTABLE SHELVES

There will be twelve (12) shelves provided compartments: LS2 (two), LS3 (two), LS7 (two), RS2 (two), RS5 (one), RS6 (two) and RS7 (one). The shelf construction will consist of .188" aluminum with a dual action finish. A capacity rating will not be available on this item due to a reduced side height being less than 2.00". 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 side height of the shelf/shelves will be as follows:

- Front: 1.00" high
- Rear: 2.00" high
- Left & Right Sides: 2.00" high

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ONE (1) WAY UTILITY SLIDE-OUT FLOOR MOUNTED TRAY

There will be two (2) floor mounted utility slide-out tray(s) provided in compartments LS4/RS4, LS5/RS5. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of .19" thick aluminum for the tray bottom and special aluminum extrusions for the tray sides, ends and tracks. The corners will be welded. The finish will be unpainted aluminum with a DA finish.

The tray will be 3.00" high x three quarters (3/4) of the depth of the transverse compartment x as wide as possible for the compartment.

The tray will be supported with a minimum of six (6) ball bearing rollers. The tray will slide out two thirds (2/3) of its length in one (1) direction only.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted slide-out tray(s) with 2.00" sides provided in compartment RS1. Each tray will be rated for up to 500lbs. in the extended position. The tray(s) will be constructed of a minimum .13" aluminum. The finish will be unpainted aluminum with a DA finish.

The tray(s) will be designed for maximum compartment width and depth.

Slides will be equipped with ball bearings for ease of operation and years of dependable service. The slides will be located on the sides of the tray so that the tray can be located as close to the compartment floor as possible.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

TWO (2) WAY UTILITY SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted utility slide-out tray(s) provided in compartments LS6/RS6. Each tray will be rated for up to 500lbs. in the extended position. The tray(s) will be constructed of .19" thick aluminum for the tray bottom and special aluminum extrusions for the tray sides, ends and tracks. The corners will be welded. The finish will be unpainted aluminum with a DA finish.

The tray will be 3.00" high x full depth of the transverse compartment x as wide as possible for the compartment.

The tray will be supported with a minimum of six (6) ball bearing rollers. The tray will slide out two thirds (2/3) of its length to either side of the apparatus.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

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TOOLBOARD ADDED TO TRANSVERSE SLIDE-OUT TRAY

An aluminum toolboard will be provided and mounted in a two (2)-way slide-out tray that spans the full depth of a transverse compartment (tray not included). The toolboard will be constructed of 0.19" thick aluminum that is DA finished. The toolboard will be provided with 0.20" diameter holes in a pegboard pattern with 1.00" centers between holes. A 1.00" x 1.00" aluminum tube frame will be welded to the edge of the pegboard.

The toolboard will span the full depth of the slide-out tray and will be as tall as possible for the specified mounting location.

The toolboard will be mounted on aluminum tracks to allow for side to side adjustment within the tray.

The total capacity rating of the toolboard will vary depending on the tray it is mounted in (capacity rating for the toolboard will match the capacity rating of the tray it is mounted in).

A total of Two (2) toolboard(s) will be provided and mounted in the slide-out tray(s) located in compartments D5/P5 and D6/P6. See compartment layout for sizing requirements for these toolboards.

BACKBOARD STORAGE

There will be a storage compartment located in the transverse compartment. Storage compartment shall be mounted to the ceiling and located in compartment D4/ P4. This storage bin will be large enough to hold four (4) backboards that are 73.00" long x 18.00" wide x 3.00" high; when lying flat. A Velcro® strap will be provided on each side to prevent side to side movement of the backboards. The backboards will be accessible from the driver's or passenger's side and will each be stored in individual slots. This storage bin will be painted to match the compartment interior.

CABLE RELEASE

A cable release shall be provided to allow one handed operation of the lock for slide out tray(s). A cable shall be connect to the lock for operation of the lock release, it will release the lock and release the tray. Cable shall be plastic coated.

A total of three (3) shall be provided for the three (3) transverse floor mounted roll out trays.

COMPARTMENT BETWEEN TOW EYES

A compartment will be supplied at the rear of the unit, above the rear bumper. It will be 8.50" high x 25.75" wide x 27.00" deep. The compartment will have a single-pan smooth aluminum drop-down door with a D-ring latch.

MATTING, COMPARTMENT FLOOR

Turtle Tile compartment matting will be provided in 15 compartments on the compartment floor. The locations are, all compartments except RS1.

The Turtle Tile will be black and the leading edge of the matting will include the beveled edge. The beveled edge will be black .

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MATTING, COMPARTMENT SHELIVING

Turtle Tile compartment matting will be provided in 19 shelves. The locations are, all shelves and trays.

The color of the Turtle Tile will be black.

VERTICAL COMPARTMENT PARTITION

One (1) partition will be bolted in compartment LS1, 20" to the right of the door opening edge. Partition will be located in the upper (shallow) portion of the compartment and will be sized to extend from the top to the fixed shelf in this compartment vertical height of the compartment. Each partition will be DA finished.

PARTITION IN TRANSVERSE COMPARTMENT

One (1) partition will be bolted in a location to be determined at the pre-construction conference. Each partition will be the full vertical height of the compartment.

REAR WALL

The entire rear surface of the apparatus and all the doors will be covered with smooth aluminum.

FLOOR EXTENSION

There will be a compartment floor extension provided. The floor extension will extend from the area over the frame rails to within an inch of the compartment door. The floor extension will have a 1.00" vertical downturned lip and no return flange.

A total of four (4) will be provided and located in compartments LS5, LS6, RS4 and RS6.

RUB RAIL

Bottom edge of the side and rear of the body 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. These fender crowns must be wide enough to prevent splashing onto the body from the specified tires.

A rubber welting will be provided between the body and the crown to seal the seam and restrict moisture from entering.

A dielectric barrier will be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

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TILLER CAB HANDRAILS

A U-shaped handrail will be installed on each side of the truck on the forward side of the tiller cab access steps. The handrail will extend upward from the existing tiller cab handrail and form a U-shape approximately 10.00" high above the top of the body. The standard handrail will be provided on the rearward side of the steps. Handrails will be 1.25" diameter anodized aluminum extrusion, with a knurled 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.

AIR BOTTLE STORAGE (SINGLE)

A quantity of two (2) air bottle compartments, 7.75" in diameter x 26.00" deep, will be provided on the left side rearward of the rear wheels and on the right side rearward of the rear wheels. A brushed 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 Dura-Surf friction reducing material and strap to contain the air bottles will be provided.

AIR BOTTLE STORAGE BIN

A storage assembly shall be provided for storage of fifteen air bottles to be installed compartment RS3. The rack shall allow for three (3) bottles high x five (5) wide. The storage bin shall be formed out of aluminum with "v" angled pieces formed on vertical posts to provide separation for the air bottles.

EXTENSION LADDER

There will be two (2) 35' two (2) section aluminum Duo-Safety Series 1200-A extension ladder(s) provided.

ADDED EXTENSION LADDER

There will be two (2) 28', two (2) section, aluminum, Duo-Safety Series 1200A extension ladder provided.

ROOF LADDERS

There will be two (2) 16' aluminum Duo-Safety Series 875-A roof ladders provided.

ADDED ROOF LADDER

There will be one (1) 12' roof, aluminum, Series 775-A provided.

ADDED ROOF LADDER

There will be one (1) 16' roof, aluminum, Series 875-A provided.

ADDED ROOF LADDER

There will be one (1) 20' roof, aluminum, Series 875-A provided.

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ATTIC EXTENSION LADDER, AERIAL

There will be a 15' combination, aluminum, Duo-Safety, Series 300A extension ladder provided.

GROUND LADDER STORAGE

The ground ladders will be removable from the center rear of the apparatus.

The ladders will be individually stored in stainless steel slides and will be arranged in such a manner that any one (1) ladder can be removed without having to move or remove any other ladder. Black Dura-Surf friction reducing material will be added to the stainless steel slides, on the bottom horizontal surfaces, of the ladder storage rack.

A door will be provided at the rear. The door will be capable of opening at a minimum of 130 degrees to aid in ladder storage. The door will be a single lift-up door constructed of aluminum, painted job color, with D-ring handles and pneumatic lift assist cylinders.

Doors will be of double pan aluminum construction. Single sheet aluminum doors will not be considered.

LADDER STORAGE LIGHTING

There will be 21.00" white 12 volt DC LED strip lights in the torque box ladder storage compartment. One (1) light will be provided on each side of the ladder storage area.

The lights will be activated when the ladder storage compartment door is opened.

ADDITIONAL FOLDING LADDER

One (1) 10' aluminum Series 585-A Duo-Safety folding ladder will be installed in a U-shaped trough inside the ladder storage compartment.

NESTED LADDER STORAGE

There will be nested ladders on the left side of the ladder storage compartment. The ladders will be nested so that one ladder can be removed without removing the adjoining ladder.

PIKE POLE, 10'

One (1) pike pole 10' long Nupla ventilation hook with an aluminum "D" handle will be provided and located at the aerial tip.

10' PIKE POLE

There will be Two (2) pike poles pike pole(s) Fire Hooks Unlimited, model APH-10, ten (10)-feet long with a fiberglass handle provided and located in the rear ladder storage compartment.

10' DRYWALL HOOK(S)

One (1) pike pole, Fire Hooks Unlimited # DWHS-10, with a fiberglass handle will be provided.

6' DRYWALL HOOK

One (1) pike pole, Fire Hooks Unlimited DWHS-6 with a fiberglass handle and gas shut-off and directional slot knob end will be provided.

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PIKE POLE

There will be two (2) Fire Hooks Unlimited UH-6, 6' pike pole(s) with fiberglass handles provided. The pike pole(s) will be stored on the apparatus.

PIKE POLE STORAGE IN TORQUE BOX/LADDER STORAGE

There will be aluminum tubing provided in the torque box/ladder storage area for a total of eight (8) pike poles.

If the head of a pike pole can come into contact with a painted surface, a stainless steel scuffplate will be provided.

PIKE POLE STORAGE

Smooth aluminum U-shaped trough(s) for the storage of two (2) pike poles, with D-handle style grip, will be provided and installed on the underside of the backboard storage troughs. Exact location to be determined at the construction review inspection.

PIKE POLE STORAGE

Aluminum tubing will be used for the storage of eight (8) pike poles and will be located on the forward edge of the vertical toolboard in compartment LS6/ RS6. Exact location to be determined at the construction review inspection. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

BELL

A chrome plated, 12.00" bronze cast bell, complete with an eagle, will be mounted on the passenger side radius corner of cab face. The cab will be properly reinforced to support the weight of the bell, the reinforcement bracket allow the bell to mount toward the upper corner of the windshield. A rope pull, for the bell, will be installed inside the cab.

AIR HORN SYSTEM

One (1) chrome finish, stutter tone, Grover, Model 1510, air horn approximately 24.50" long will be provided and recessed in the front bumper. The air horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed to prevent the loss of air in the brake system.

AIR HORN LOCATION

The air horn will be located on the right side of the bumper, just outside of the frame rail.

AIR HORN CONTROL

The air horns will be actuated by a chrome push button located on the officer side of the engine tunnel and by the horn button in the steering wheel. The driver will have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

The chrome push button on the officer's side will be located to be determined at the pre-construction conference.

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ELECTRONIC SIREN

A Whelen, Model 295HFS2X, electronic remote siren with recessed mounted control head, a second Whelen, Model 295HFSDA, amplifier kit, and noise canceling microphone, will be provided.

This siren to be active when the battery switch is on and that emergency master switch is on.

Siren head will be recessed in a switch panel, panel #7, as required by the customer.

The electronic siren will be controlled on the siren head only. No horn button or foot switches will be provided.

SPEAKER

There will be one (1) Cast Products, Model SA2403, 100 watt, inside-the-bumper mount with trim bezel speaker provided. The speaker will be connected to the siren amplifier.

The speaker will be recessed in the right side of the front bumper, just outside of the frame rail.

AUXILIARY MECHANICAL SIREN

There will be a Federal Signal Model Q2B mechanical siren furnished on the front of the apparatus. The siren will be energized from a battery direct circuit through a 2-gauge cable to a solenoid that is energized from the emergency master switch. Additional customer selectable controls will be included for the momentary activation of this siren.

There will be a momentary siren brake switch provided in the cab on the switch panel.

The mechanical siren will be recessed in the front bumper notch on the left side. The siren will be properly supported using the bumper framework.

The mechanical siren will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

A second siren brake switch will be installed on the passenger side.

FRONT ZONE UPPER WARNING LIGHTS

There will be a 92.00" Whelen® Freedom® IV Rota-Beam™ lightbar installed on the cab roof

The lightbar will include the following components:

- One (1) red flashing in a semi circle pattern LED module in the left side rear corner position.
- One (1) dual alley LED module in the left side end position.
- One (1) red flashing in a semi circle pattern LED module in the left side front corner position.
- One (1) red flashing LED module in the left side first front position.
- One (1) red flashing in a semi circle pattern LED module in the left side second front position.
- One (1) red flashing LED module in the left side third front position.
- One (1) red flashing in a semi circle pattern LED module in the left side fourth front position.
- Open in the left side fifth front position.
- One (1) white flashing in a semi circle pattern LED module in the center front positions.

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- Open in the right side fifth front position
- One (1) red flashing in a semi circle pattern LED module in the right side fourth front position.
- One (1) red flashing LED module in the right side third front position.
- One (1) red flashing in a semi circle pattern LED module in the right side second front position.
- One (1) red flashing LED module in the right side first front position.
- One (1) red flashing in a semi circle pattern LED module in the right side front corner position.
- One (1) dual alley LED module in the right side end position.
- One (1) red flashing in a semi circle pattern LED module in the right side rear corner position.

The lens color will be clear.

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
- a switch to control the left side alley LED module
- a switch to control the right side alley LED module

The white flashing LED modules will be disabled when the parking brake is applied.

The four (4) red flashing in a semi circle pattern and the four (4) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

TRAFFIC LIGHT CONTROLLER

There will be a GTT, Model 794*^M Multimode LED Opticom™ traffic light infrared emitter / GPS antenna with national standard high priority remote mounted on the front edge of the cab centered above the lightbar on a "Z" bracket.

A Model 2100 control unit, measuring 7.25"L x 5.44"W x 1.63"H will be provided in the cab.

The Opticom™ traffic light controller will be activated by a cab switch with emergency master control.

The Opticom™ traffic light controller will have a driver side momentary cab switch and a passenger side momentary cab switch with no emergency master control.

The Opticom™ traffic light controller will be disabled when the parking brake is applied.

SPECIAL HEIGHT TRAFFIC EMITTER BRACKET

The traffic emitter will be mounted, to a fabricated bracket, allowing the clearance over the lightbar for proper operation. This bracket will be located directly behind the lightbar, centered and shall extend up and over the lightbar ("Z" bracket design) so the emitter will be positioned directly over the top of the lightbar and below the Go Light, which is directly rearward and will be painted job color.

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CAB FACE WARNING LIGHTS

There will be two (2) Whelen, Model M6*, LED warning lights and two (2) Whelen, Model 6RB**, LED warning lights installed on the cab face above the headlights in a quad bezel.

The Whelen, Model M6*, LED warning lights will be installed in the outer position:

- The driver's side front outside warning light to be red.
- The passenger's side front outside warning light to be red.

The Whelen, 6RB**, LED warning lights will be installed in the inner position as additional lights.

- The driver's side front inside warning light to be red.
- The passenger's side front inside warning light to be red.

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

There will be one (1) switch, located in the cab on the switch panel, to control the lights.

The inner LED lights may be load managed if colored and any white lights will be disabled when the parking brake is applied.

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.

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 one (1) each side on the front cab corner on 15 degree forward polished stainless steel brackets. The side front lights to be red.
- Two (2) lights one (1) each side of cab rearward of crew cab doors. The side middle lights to be red.
- Two (2) lights one (1) each side on the rear fender panel. The side rear lights to be red.

The lights will include a lenses that the same color as the LED's.

There will be a switch in the cab on the switch panel to control the lights.

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INTERIOR CAB DOOR WARNING LIGHTS

There will be four (4) Weldon, Model 8401-0000-20, amber 12 volt DC LED flashing strip lights provided.

- One (1) light on the driver's side cab door over the window.
- One (1) light on the passenger's side cab door over the window.
- One (1) light on the passenger's side crew cab door over the window.
- One (1) light on the driver's side crew cab door over the window.

Each light will be activated when the battery switch is on and the adjacent door is opened.

Each light will be installed so the flash pattern directs traffic away from the doors.

SIDE WARNING LIGHTS

There will be two (2) Whelen, Model M6* LED flashing warning light(s) with bezel(s) provided one (1) on the left side cab, one (1) on the right side cab, each behind the front doors and as high as possible.

The color of the lights will be red.

All of these lights will include a lens color that is the same as the LED's

These lights will be activated with the Side Zone Lower warning lights.

WARNING LIGHTS (SIDE)

There will be eight (8) Whelen LIN3 Super LED lights, Model RS*02ZCR, provided and located in the body rub rails centered and under compartments LS1, LS2 (centered), LS3/LS4, LS5/LS6, RS1, RS2 (centered), RS3/RS4, RS5/RS6.

The color of each light will be red LED with clear lens.

Each light will be provided with a chrome plated ABS flange.

The light(s) will be activated with the emergency master.

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen®, Model M6*, LED flashing warning lights 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 ZONE LOWER LIGHT FLASH PATTERN ADJUSTMENT

The flash pattern of the two (2) Whelen M6** light(s) located in the lower rear zone will be adjusted to SignalAlert™ L/R, pattern number 3.

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REAR WARNING LIGHTS

There will be two (2) 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, on the rear of the tiller cab, upper corners above the rear window, one (1) on the left side and one (1) on the right 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 HOSE BED WARNING LIGHTS

There will be two (2) Whelen® Rota-Beam™, Model R416*F, 4.88" high x 6.44" wide LED beacons.

- The driver's side beacon to include amber LED's.
- The passenger's side beacon to include amber LED's.
- The domes to be the same color as the LED's.

There will be a switch located in the cab, on the switch panel to control the beacons.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen® Model TAZ86, 1.75" high x 30.87" long x 2.18" deep, traffic directing light with eight (8) amber LED modules 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 remote flash control to be energized when the emergency master switch is on.

This traffic directing light will be surface mounted with a treadplate box at the rear of the apparatus as high as practical.

The traffic directing light controller will be located within the switch panel on the center console. The controller will be within easy reach of the driver.

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 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

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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.

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.

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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.

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.

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GENERATOR

The apparatus will be equipped with a complete electrical power system. The generator will be an Onan 10.0 kW Hydraulic unit with electronic control. The wiring and generator installation will conform to the present National Electrical Codes Standards of the National Fire Protection Association. The installation will be designed for continuous operation without overheating and undue stress on components.

Generator Performance

- Continuous Duty Rating: 10,000 watts
- Nominal Volts: 120/240
- Amperage: 83.3 @ 120volts, 41.6 @ 240 volts
- Phase: Single
- Cycles: 60 hertz
- Engine Speed at Engagement: Idle
- RPM range: 750 to 3,300

Generator Dimensions

- Length: 32.0 inches
- Width: 15.8 inches
- Height: 13.70 inches
- Weight: 191 pounds (generator only)

The output of the generator will be controlled by an internal hydraulic system. An electrical instrument gauge panel will be provided for the operator to monitor and control all electrical operations and output.

The generator will be driven by an engine transmission power take off unit, through a hydraulic pump and motor.

The generator will include an electrical control inside the cab. The hydraulic engagement supply will be operational at any time (no interlocks).

An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

The generator hydraulic circuit will include a soft start valve to protect the generator components during PTO engagement.

Generator Instruments and Controls

To properly monitor the generator performance a digital meter panel will be furnished and mounted next to the circuit breaker panel. The meter will indicate the following items:

- Voltage
- Amperage for both lines

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- Frequency
- Generator run hours
- Over current indication
- Over temperature indication
- Service required indication
- "PTO" engagement indication
- "Power On" indication
- Two (2) fuse holders with two (2) amp fuses (for indicator light 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.

Generator Wiring:

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. The equipment will be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage. The following electrical components will be the minimum acceptable quality standards for this apparatus:

Wiring:

All electrical wiring will be fine stranded copper type. The wire will be sized to the load and circuit breaker rating; ten (10) gauge on 30 amp circuits, 12 gauge on 20 amp circuits and 14 gauge on 15 amp circuits. The cable will be run in corner areas and extruded aluminum pathways built into the body for easy access.

Load Center:

The main load center will be a Cutler Hammer with circuit breakers rated to load demand.

Circuit Breakers:

Individual breakers will be provided for all on-line equipment to isolate a tripped breaker from affecting any other on-line equipment.

GENERATOR LOCATION

The generator will be mounted in the area above the goose neck of the tiller trailer. 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.

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GENERATOR REMOTE START

There will be one (1) remote start switch(s) provided in the tiller cab; right overhead switch panel, to engage the hydraulic generator PTO and field. A light at each switch location will be provided to indicate that the generator is running.

CIRCUIT BREAKER PANEL

There will be a Square D, Q-O series circuit breaker panel as small as practical provided.

The circuit breaker panel will be located in LS6, front wall, as high as possible, behind door frame.

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.

No guide is required on the reel assembly. 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) outboard on the driver's side gooseneck and one (1) outboard on the passenger's side gooseneck.

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 Carol Super Vu-Tron II yellow 12/3 electrical cord. A Hubbell L5-15, 15 amp, 120 volt, twist lock connector body will be installed on the end of the cord.

REEL ENCLOSURE

An aluminum treadplate enclosure will be installed over the reel. The enclosure will be provided with a stainless steel hinge that will allow the cover to be opened.

A captive roller assembly will be provided to assist with the payout of the cord. A ball stop will be provided on the cord to stop the cord at the roller assembly.

A total of two (2) will be installed for each of the electrical cord reels.

120 VOLT RECEPTACLE

There will be two (2), 15 amp 120 volt AC three (3) wire twist lock receptacle(s) with flip up cover(s) installed one (1) on the drivers side trailer fender panel (rearward) and one (1) on the passenger side trailer fender panel (rearward). The NEMA configuration for the receptacles will be L5-15R.

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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

FOUR (4)-SECTION 107 FOOT TRACTOR-DRAWN 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.

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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 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.

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The inside width dimensions of the ladder will be:

- Base Section 41.87"
- 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 be severed, at any point within the hydraulic system. The integral holding valves will NOT be located in the transfer tubes.

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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:

- Collision avoidance to prevent accidental body damage
- Prevent the aerial from being rotated into an unstable condition.

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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.

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 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	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

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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 lbs. 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.

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.

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.

ROPE TIE DOWN AT GOOSENECK

There will be two (2) pairs of rope tie downs provided each side of the tiller gooseneck in the forward and rearward locations. Equal quantities will be provided on each side. The tie downs will be rated for a straight line pull of 9000 lbs. and will be nickel plated.

HOIST RINGS

There will be two (2) stainless steel hoist rings located on the turntable.

One (1) to be mounted on each side of the vertical surface of the lift cylinder ear at the front of the turntable (aerial side/ underneath).

The rating of each hoist ring will be a maximum of 1000 lbs. There will be a label indicating this rating provided next to the hoist rings.

BOOM SUPPORT SCUFFPLATES

There will be scuffplates provided on the top and sides of the aerial boom support that come into contact with the aerial device. The scuffplates will be brushed stainless steel.

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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 #253 white, to match Sikkens #FLNA 4002.

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 red 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 black coating. Each step will incorporate an LED light to illuminate the stepping surface.

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.

TEMPORARY SCABBARD AT END OF AERIAL

There will be a total of two (2) vent saw scabbard(s) provided. The scabbard(s) will be mounted on each side of the aerial egress. The scabbard(s) will be DA finished.

RUBBISH HOOK MOUNTING BRACKET

Mounting will be provided near the end of the fly section of the aerial ladder for a rubbish hook.

The bracket will be sized to hold a Nupla 10' roof vent rubbish hook.

LADDER STORAGE MOUNTING BRACKETS

Mounting will be provided on the right side of the aerial device while viewed from the turntable for storage of one (1) roof ladder(s). The bracket(s) will be located inboard of the boom panel at the base section. The bracket(s) will hold the boom panel as close to the base section as possible and include straps to secure the ladder.

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The mounting brackets will accommodate a 16' Duo-Safety 875-A roof ladder.

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), Amdor®, Model AY-LB-12HW012, 190 lumens, 12" long, 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 SURFACE COLOR

The protective, non-slip coating on the aerial turntable platform base will be black.

TURNTABLE ALIGNMENT ARROWS

The turntable alignment arrows will be covered with luminescent material.

TURNTABLE CONTROL CONSOLE COVER LATCH

A rubber hood style latch will be provided on the cover of the turntable control console to prevent movement during travel.

INFORMATION CENTER

There will be an information center provided at the aerial turntable control station. 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 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.

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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

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
- Short jacked 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.

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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 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.

STABILIZER CONTROL STATION

There will be an easily accessible control station located on the trailer gooseneck, one (1) each side of the apparatus. The following controls and indicator lights will be clearly identified and conveniently located for ease of operation and viewing at each control station:

- Driver Side/Passenger Side In/Out control switches
- Driver Side/Passenger Side Up/Down control switches
- Driver Side/Passenger Side Fully Extended indicator lights
- Driver Side/Passenger Side Firm On Ground indicator lights
- Stabilizer Emergency Power control switch
- Trailer Level Assist control toggle switch
- Global Safety Interlock Override red guarded switch
- Aerial system Emergency Stop switch
- Aerial system Emergency Stop Activated indicator light

TURNTABLE CONTROL STATION

There will be one (1) device control station located on the right 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.

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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 following items will also be provided at the turntable control station, clearly identified and 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
- 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 two (2) hydraulically operated out and down style stabilizers. 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 17' measured from the centerline of the jack footpads when the beams are fully extended. The beams will be 6.81" wide x 8.88" 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 57.25" stroke.

The vertical jack cylinders will be capable of 12.00" 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 end, 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.

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Each stabilizer jack will have a polished stainless steel shield. The stainless steel shield will be of the split-pan design and will be a maximum 12.50" 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.

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 24.00" square 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. There will be one (1) pad located on each side of the apparatus, behind the stabilizers.

STABILIZER PAD HARDWARE AND BRACKETS

The auxiliary stabilizer pads will have slide-on brackets with a lower profile hardware (bolts) as well as shorter brackets on the pads. This will allow the pads to be stored within their respective brackets with the brackets facing up or down.

STABILIZER CONTROLS

An electrically controlled hydraulic valve will power stabilizer movement. The valve can also be manually controlled in the event of electrical malfunction. Hydraulic power override controls will be incorporated into the valve. The manual override mechanism will be completely sealed within the valve assembly to prevent any possibility of corrosion.

The stabilizer controls will be located on the trailer gooseneck, one (1) each side of the apparatus, to provide the operator with a full view of each stabilizer being positioned. Each stabilizer control panel will include the following:

- Driver Side/Passenger Side In/Out control toggle switches
- Driver Side/Passenger Side Up/Down control toggle switches
- Driver Side/Passenger Side Fully Extended indicator lights
- Driver Side/Passenger Side Firm On Ground indicator lights
- Stabilizer Emergency Power control toggle switch
- Trailer Level Assist control toggle switch
- Global Safety Interlock Override red guarded toggle switch
- Aerial system Emergency Stop mushroom switch
- Aerial system Emergency Stop Activated indicator light

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As a safety device, an electrically actuated diverter valve will be provided. The hydraulic power will be diverted to the aerial ladder controls automatically the instant all stabilizer jacks are firmly planted on the ground. Once the aerial ladder is raised from the bedded position, the stabilizer hydraulic power is cut off so the stabilizers will not accidentally be moved while the aerial is being operated.

To aid in leveling the unit, two bubble type angle indicators will be located near the stabilizer controls. One indicator will show the angle of the truck from the front to rear and the other will show the side to side angle of the truck. The indicators will be color coded green to show when the truck has been properly leveled allowing the aerial device to be operated at full capacity.

A stabilizer deployment audible warning alarm will be provided at each side of the body, activated by the stabilizer movement.

A "Stabilizers Not Stowed" indicator light will be provided in the cab within view of the driver. It will illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the vehicle if it is moved. The stabilizer system will also be wired to the "Do Not Move Truck" indicator light. This light will flash whenever the apparatus parking brake is not engaged and the stabilizers are not fully stowed.

STABILIZER PINS

The stabilizer jacks will not have holes for the stabilizer pins.

STABILIZER CONTROL BOX/ VALVE-POWER DISTRIBUTION ACCESS DOORS

There shall be brushed stainless steel doors hinged on the bottom with a SouthCo C2 chrome raised trigger lever latches provided over each stabilizer control box.

There shall be brushed stainless steel doors with a SouthCo C2 chrome raised trigger lever latches provided over the valve and power distribution box doors. These doors shall be bottom hinged.

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.

The hydraulic oil will be a premium Multi-Vis product having a leading edge additive package, provide oxidation stability, be extremely shear stable and maximum anti-wear properties. All oil delivered to the manufacturing site will have a minimum ISO cleanliness level of 18/15/13.

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 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.

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OIL RESERVOIR

The oil reservoir will have a minimum capacity of 40 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 cap will have a 40 micron filter to provide protection from contamination. 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 combination sight glass and thermometer will be mounted to the reservoir in an easily viewable location.

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 remote mounted 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 microns

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.

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 32 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.

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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 aerial device will utilize a microprocessor-based control system. The system will consist of the following components:

Control System Modules

Each of the control system modules will be configured as follows:

- Sealed to a NEMA 4X rating
- Operating range from -40 degrees F to 156 degrees F (-40 degrees C to 70 degrees C)
- Communicate using J1939 data link
- Two (2) diagnostic LED lights
- 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
- Up to 16 diagnostic LEDs on each module
- Ground matrix identification system

The following control system modules will 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)
- Current Control Module
- Built-in fault sensing
- Three (3) analog inputs
- Eight (8) digital outputs
- Pulse width modulating (PWM) capable
- 3A continuous per output
- Closed Loop System
- Circuit protection based on actual current draw (not affected by heat)
- 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

TRACKING LIGHTS

There will be two (2) Whelen Micro Pioneer, Model MPB* 12 volt DC LED lights furnished on the aerial device.

- One (1) installed on the driver's side of the base section of the aerial device.
- One (1) installed on the passenger's side of the base section of the aerial device.

The painted parts of this light assembly to be white.

There will be a switch with appropriate identification labels provided at the turntable console for the tracking lights.

AERIAL LOCATOR LIGHT

There will be two (2) beacons installed at the aerial tip for the purpose of locating the aerial device while in operation.

The beacons will be Whelen Model L31H*F, LED.

Both beacons will be activated whenever the aerial is raised from the cradle.

The color of the locator light will be amber.

The lens color will be the same color as the LED's.

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

LIGHTING ON AERIAL LADDER

There will be TecNiq, Model D02 LED rung lighting provided on both sides of the aerial ladder base, lower and upper mid, and fly sections. The lighting will be located adjacent to the ladder rungs along the lower rail of the ladder sections and will run the length of the ladder section.

The color of the sections will be:

- The base section of the ladder to be blue.
- The lower mid section of the ladder to be blue.
- The upper mid section of the ladder to be blue.
- The fly section of the ladder to be blue and the last four (4) rungs to be red.

The LED rung lighting will be activated when a switch within reach of the driver is activated and a switch at the turntable operator's panel is activated through the master battery switch.

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

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STABILIZER WARNING LIGHTS

There will be two (2) Whelen, Model M6*, LED flashing warning lights with Whelen, Model M6FC, chrome flanges installed on the stabilizer cover panels, one (1) each side.

The front stabilizer pan lights will be red LED with a lens the same color 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.

STABILIZER SCENE LIGHTS

There will be one (1) Truck-Lite, Model 44042C 4.00" LED, scene light installed under each stabilizer beam to illuminate the surrounding area. A total of two (2) lights will be installed. These lights will be activated by the aerial master switch.

120-VOLT RECEPTACLE AT TIP

A 120-volt, 15 amp, twist lock receptacle, with weatherproof cover will be provided at the tip of the aerial device.

120 VOLT LIGHTING AT TIP

There will be two (2) Whelen, Model PFP2AC, white 120 volt LED floodlight(s) installed in white Whelen, Model PBA206, bail bracket(s) located on the tip of the ladder, one (1) on the driver and one (1) on the passenger side mounted vertically and allowed to swivel.

There will be a reinforcement plate provided for the base of the bail bracket to hold the light to the special mounting bracket.

Light(s) will be switched at the turntable and at the aerial tip.

2-WAY AERIAL COMMUNICATION SYSTEM

There will be a Fire Research model ICA900-112 two-way intercom system provided. The control module will be located on the turntable operator console, provided there is room, and have an LED volume display and push-button volume control.

A hands free module will be located at the aerial tip or platform and constantly transmit to the other module unless the control module push-to-talk button is pressed.

Each intercom unit will be weatherproof.

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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.

AIR HORN CONTROL AT AERIAL TURNTABLE

An air horn control button will be provided at the aerial turntable. This button will be red in color and properly labeled. Collector ring space must be available for this option to be utilized.

MANSAVER™ BARS, AERIAL TURNTABLE

ManSaver™ bars will be red in color and 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.

Two (2) 1.50" drain valves will be located at the lowest points of the waterway system and will be routed to drain through the center of the 5th wheel.

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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, Sabermaster, 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.

In the stowed position, the monitor nozzle will be located on the driver side.

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.

AERIAL WATERWAY INLET

The aerial waterway will be plumbed from the fifth wheel area to the waterway swivel with 4.00" pipe. A 5.00" inlet will be located on each side of the apparatus complete with a chrome plated cap. The individual "line" pressure gauges for the inlets will be manufactured by Class 1. They 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#.

The individual pressure gauge will be installed as close to the inlet as practical.

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.

ADAPTER, STORZ INLET

A 5.00" FNST x 4.00" Storz adapter with blind cap will be provided on the aerial inlet.

MONITOR AUTO STOW

The monitor shall be set to auto stow facing the left side of the body to allow the operator to verify the monitor is stowed prior to nesting the device.

WATERWAY INLETS BUTTERFLY VALVE

An Akron Model 7940 butterfly valve will be provided at the aerial waterway inlet at each side. The hat bracket on the gooseneck will be designed to enclose the butterfly valve with the handwheel exposed.

QUICK-LOCK WATER WAY LOCK LABELING

The Quick-Lock waterway locking mechanism will be labeled "LOWER FLY" "RELEASE" "UPPER FLY". Three (3) labels will be installed on the side and three (3) on the top of the pinnable waterway release lever mounting bracket.

2.50" AUXILIARY OUTLET AT AERIAL TIP

An auxiliary hose connection outlet shall be supplied at the tip of the aerial ladder. It shall be located on the lefthand side of the aerial waterway.

Flow to the auxiliary outlet shall be supplied by 2.50" piping. A 2.50" gate valve with a non-rising stem and crank handle shall be supplied. A cap and chain shall be provided. The 2.50" gate valve shall be painted red.

Flow to the aerial waterway monitor shall be controlled by a 4.00" aluminum butterfly valve with a handwheel. The valve shall be located at the monitor inlet.

A 200 psi relief valve and a .75" automatic drain valve shall be supplied in the waterway at the tip.

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.

LUBRICATION CHART

One (1) copy of a lubrication chart will be provided with the manuals. The chart will indicate the total number of lubrication points and their locations.

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TILLER CAB

A permanently mounted tiller cab will be located on top of the tiller trailer, to the rear of the aerial ladder. The maximum overall height of the tiller cab will not exceed 134.00". The tiller cab will be totally enclosed.

The cab windshield will be automotive approved tinted safety glass and will provide a minimum of 1,513 square inches of clear viewing area. A smoked Lexan™ sun visor will be provided in the tiller cab above the windshield. There will be a black plastic thumb latch provided to help secure the sun visor in the stowed position. Each side window, directly rearward of the windshield, will be more than 536 square inches. The side windows, combined with the windshield, will provide a minimum of 2,585 square inches of unobstructed viewing area. In order to provide maximum visibility for the tillerman, there will be no corner posts at the forward corners of the windshield.

The upper area of each tiller cab door will be contoured into the roof, providing greater clearance when entering and exiting the tiller cab. The tiller cab doors will be equipped with drop-down sliding window. The windows will be 18.00" wide x 31.00" high.

The rear wall of the tiller cab will have a vertically-split sliding window. The window will be 33.50" wide x 27.75" high.

The tiller cab floor will be constructed of aluminum treadplate.

A two (2) speed electric windshield wiper with washer will be provided for the front windshield. The windshield washer reservoir will have a capacity of two (2) quarts and will be located forward of the tiller cab.

An adjustable, telescopic steering column will be provided.

The diagnostic plug for the trailer ABS system will be provided in the driver side tiller access stepwell, behind the fuel fill door.

The following controls/alarms will be provided inside the tiller cab:

- Buzzer signaling system with push button in tiller cab steering wheel as well as a labeled push button in the tractor cab, within reach of the driver.
- Jackknife alarm

The following will be provided on the steering column support pedestal:

- Two (2) heater/defroster outlets
- Heater/defroster control switch

The following controls/gauges will be located in the upper control panel:

- Step light switch
- Tiller wheel position indicator gauge. (L-C-R)
- Two (2) 2.00" diameter amber turn signals

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- Windshield wiper/washer control switch

TILLER CAB DOME LIGHT

There will be one (1) Whelen, model 60C*EGCS, 6.00" round dual LED dome light installed in the tiller cab.

- The color of the LED will be red and white.
- The white LED will be controlled by the door switches and the lens switch.
- The color LED will be controlled by the lens switch.

TILLER CAB HEATER/DEFROSTER

There will be two (2) DC Thermal, Model SA12-4000, combination heater/defroster provided in the tiller cab. The system will be 12 volt and will be powered through the tractor ignition circuit.

A thermostat integral to the unit will be provided.

TILLER CAB AIR CONDITIONING

Air conditioning will be provided for the tiller cab.

The unit will be manufactured by Danhard Inc.

The air conditioner will have cooling capacity of 13,500 BTU.

The unit will be 120 volt AC and will be run off of the onboard generator. The full load amperage draw will be 12.00 amps in the cooling mode.

The condenser will be located ahead of the tiller cab on the top deck of the tiller trailer. The air conditioning unit will not increase the overall height of the tiller cab.

ANGLED BRACKET FOR CAB CONTROLS

The heater and air conditioning controls will be located on a specially designed 30 degree bracket that angles them upward toward the tillerman.

The bracket will be painted to match tiller cab interior.

TILLER CAB SEAT

A USSC, Model Magnus R-Back, air suspension seat shall be provided in the tiller cab. For increased convenience, the seat shall include a pneumatic control to adjust the height (5.00" travel) and horizontal position (6.00" travel). To provide flexibility for multiple driver configurations, the seat shall have a reclining back, adjustable from 90 degrees to 45 degrees rearward. For optimal comfort, the seat shall be provided with 17.00" deep foam. To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled.

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

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There shall be no seat riser provided in the tiller cab with this seat.

TILLER CAB STEPS

For access to the tiller cab, two (2) sets of steps shall be furnished at the rear of the apparatus, one set each side. The bottom three (3) access steps shall be full width, approximately 21.00" wide, and located just behind the tiller axle. The top step shall be full width, approximately 18.50" wide. The steps shall be such that they have a progressive angle when ascending and descending. The steps shall be securely reinforced and constructed of aluminum treadplate. The outside corners at the rear edges of the steps shall be mitered at 45 degrees. Handrails shall be provided on each side of the step assemblies for maximum safety. The steps shall be illuminated for nighttime operation.

JACKKNIFE ALARM

An audible and visual warning system will be provided to warn both drivers when the jackknife position approaches the maximum allowable angle.

TILLER WARNING INDICATOR

A warning indicator in the tractor cab will be activated if the parking brake is released and the tiller driver is not present in the tiller cab.

CONVEX MIRRORS ON TILLER CAB

An 8.00" diameter round convex mirror with adjustable arm will be installed on each side of tiller cab.

ENGINE START IN TILLER CAB

A foot switch will be provided in the tiller cab on the passenger side to allow the truck to be started. If the switch is not pressed the truck will not start.

There will be a master override switch located in the cab which will allow the truck to be started in the unlikely event that the switch at the tiller cab would fail.

The switch in the cab will be a covered momentary switch.

WINDOW DEFROST FANS

Two (2) window defrost fans will be mounted one (1) each side of the tiller steering column.

WINDOW TINT

The tiller cab rear wall sliding window will be tinted with 14% light transmission tint.

LIGHTS, TURN SIGNALS (INSIDE TILLER CAB)

The turn signal lights inside the tiller cab will be amber. There will be two (2) Truck-Lite, model 33050Y recessed LED light, mounted one (1) each side in overhead position of tiller cab.

FOOTSWITCH

A foot switch will be provided in the tiller cab to activate the buzzer signaling system. The foot switch will be installed left side.

TILLER CAB DOOR SCUFFPLATE

A piece of polished s/s scuffplate material will be provided on the bottom surface of the tiller cab doors where they contact the rubber door stop.

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SUNVISOR

A vinyl sunvisor will be provided above the windshield in the tiller cab.

TILLER TRAILER

The gooseneck area of the tiller trailer will be constructed of 100,000 psi minimum yield strength steel.

The gooseneck area will have a section modulus of 289.00 cu. in. and a resistance to bending moment of 28,900,000 inch pounds.

The gooseneck area will be 46.00" wide x 13.50" deep.

The tiller trailer frame will be box type construction to effectively resist trailer twist.

The side rails will have a 13.38" tall web over the front and mid sections of the trailer, with a continuous smooth taper to a 10.75" over the tiller axle.

The frame rails will be constructed of 80,000 psi minimum yield strength heat treated .38" thick steel, with 3.50" wide flanges and covered by top and bottom plates to form a ridged box structure. Cover plates will be 50,000 psi minimum yield strength steel.

The tiller trailer frame will have a section modulus of 257.70 cu. in., and a resisting bending moment (rbm) of 12,880,000 inch pounds over the critical regions of the frame assembly, with a section modulus of 18.96 cu. in. with an rbm of 2,085,803 inch pounds over the rear axle.

The overall length of the tiller trailer will be 471.00". The gooseneck area of the trailer will be extended 3.00".

WALKWAY, TURNTABLE TO BODY

A walkway will be provided from the aerial turntable to the tiller body.

TILLER TRAILER NON DRIVE AXLE

The tiller trailer axle will be of the independent suspension design with a ground rating of 22,800 lbs.

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.

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 chamber above rated load.

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

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The kingpin bearing will be of low friction design and be sealed for life.

Toe links that are adjustable for alignment of the wheel to the center of the trailer 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 turning angle will be 24 degrees or greater.

TILLER TRAILER NON DRIVE AXLE WARRANTY

The non drive axle system will have a **three (3) year parts** and labor warranty.

TILLER TRAILER STEERING

Dual Sheppard M110 steering gears, with integral heavy-duty power steering, will be provided.

The steering wheel will be 18.00" in diameter, and capable of tilting and telescoping.

BRAKES

The tiller trailer brake calipers will be Meritor® DiscPlus™ EX225 air disc type. The brake rotors will be 17.00" ventilated.

SUSPENSION

Independent suspension will be provided with a minimum ground rating of 22,800 lbs. 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 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 type spring and anchor lock system will allow for simple lean adjustments without the use of shims. Adjustment for a lean will be accomplished within 15 minutes. Anchor adjustment design is such that it allows 4.00" of ride height adjustment per side.

The independent suspension will have been put through a durability test that simulated a minimum of 140,000 miles of inner city driving.

TIRES

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

WHEELS, TILLER

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.

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OIL SEALS

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

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.
- 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 x 18 ft (3.6 m x 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).

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.

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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.

HYDRAULIC SYSTEM SCHEMATIC

Two (2) detailed schematic drawings will be provided for the aerial hydraulic system, including the hydraulic pump. The drawings will be per the customer's truck "as built" on line.

PAINT

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.

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6. 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.
7. 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 will be two-tone, with the upper section painted #253 white, to match Sikkens #FLNA 4002 along with a shield design on the cab face and lower section of the cab and body painted #412 red, to match Sikkens #FLNA 3284.

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.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

- 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.

PAINT

The cab will be two-tone, with the upper section painted #253 white, to match Sikkens #FLNA 4002 and the lower section of the cab painted #412 red, to match Sikkens #FLNA 3284.

The paint break will be located at the middle of the side and rear windows on the tiller cab.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be finished with primer and gloss paint to match the lower job color 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 painted are:

- Frame rails
- Frame liners
- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Air tanks
- Steel fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

FILM TECHNICAL PROPERTIES		
PROPERTY	TEST METHOD	PERFORMANCE
Color	-	Black
Film Thickness	-	0.5 - 1.5 Mils
Gloss - 60 Degree	ASTM D523	65 - 85
Pencil Hardness	ASTM D3363	2H Minimum
Direct Impact	ASTM D2794	100 in. - lbs. Minimum
Reverse Impact	ASTM D2794	60 in. - lbs. Minimum
Crosshatch Adhesion	ASTM D3359	4B - 5B
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Gravelometer	GM9508P	6 Minimum
Throwpower	GM9535P	12 - 15 in.
Cold rolled steel lab panels, Zinc Phosphate pretreatment, 0.6 mils average film thickness, cured 20 minutes @ 350°F.		
PROPERTY	SUBSTRATE PRETREATMENT	SALT SPRAY* 1000 HOURS
Corrosion Resistance	CRS / Zinc Phos / Non-Chrome	1 - 2 mm
*Salt Spray - ASTM B117; cold rolled steel lab panels cured 20 minutes @ 350°F. (Average Total Scribe Creep)		

Components treated with epoxy E-coat protection prior to paint:

- Two (2) C-channel frame rails
- Two (2) frame liners

The E-coat process will meet the technical properties shown.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

COMPARTMENT INTERIOR FINISH

The interior of the compartments will be dual action finished and not painted.

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.

The aerial device components will be painted as follows using the aforementioned seven (7) step finishing process:

- Aerial device ladder sections and extension cylinders: white 253
- Aerial turntable: white 253
- Aerial control console: white 253
- Aerial lift cylinders: white 253
- Aerial rotation motor (if applicable): white 253
- Aerial torque box, support structure, components below the rotation point, tiller axle and suspension: black 101
- Aerial stabilizers: black 101
- Aerial egress: #90 red (will be contrasting color to the aerial device ladder sections)

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

- Aerial boom support: red 412

REFLECTIVE BAND

A 10.00" white reflective band will be provided across the front of the vehicle and along the sides of the body.

The reflective band provided on the cab face will be at the headlight level.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus including part of the tillerman cab. The rear door and rear bumper will not be covered.

The colors will be red and yellow 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 red diamond grade reflective stripe provided on the forward and rear facing side of all aerial stabilizers.

REFLECTIVE STRIPE OUTLINE

A black vinyl outline will be provided for each chevron stripe at the rear of the truck.

CAB DOOR REFLECTIVE STRIPE

A 6.00" x 16.00" ruby red reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

REFLECTIVE STRIPE, TILLERMAN DOORS

A 6.00" x 16.00" ruby red reflective stripe will be provided across the interior of each tillerman's entry door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

TILLER CAB STRIPE

There will be a genuine gold leaf stripe provided on the paint break located at the tiller cab.

CAB STRIPE

There will be a genuine gold leaf stripe provided on both sides of the cab in place of the chrome molding and on the cab face with shield.

LETTERING

The lettering will be totally encapsulated between two (2) layers of clear vinyl.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

LETTERING

There will be genuine gold leaf lettering, 3.00" high, with outline and shade provided. There will be 43 letters provided.

LETTERING

There will be genuine gold leaf lettering, 2.00" high, with outline and shade provided. There will be 18 letters provided.

LETTERING

There will be reflective lettering, 10.00" high, with outline and shade provided. There will be five (5) letters provided.

LETTERING

There will be reflective lettering, 8.00" high, with outline and shade provided. There will be four (4) letters provided.

LETTERING

There will be reflective lettering, 5.00" high, with outline and shade provided. There will be five (5) letters provided.

LETTERING

There will be non-reflective vinyl lettering, 18.00" high, with no outline or shade provided. There will be five (5) letters provided.

LETTERING

There will be reflective lettering, 12.00" high, with outline and shade provided. There will be 23 letters provided.

DECAL INSTALLATION

There will be two (2) decal/s furnished by the fire department and applied by the apparatus manufacturer.

FIRE APPARATUS PARTS CD MANUAL

There will be two (2) custom parts manuals for the complete fire apparatus provided in CD format with the completed unit.

The manuals 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

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

The manuals 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 these manuals are also available on the factory 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.

CHASSIS SERVICE MANUALS

One (1) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

One (1) compact disk (CD) will also be provided that will include all of the information from the above manual.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- 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.

CHASSIS OPERATION CD MANUALS

There will be two (2) CD format chassis operation manuals provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

ENGINE WARRANTY

A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this proposal.

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Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

STEERING GEAR WARRANTY

A TRW **one (1) year** limited steering gear warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.

COMPARTMENT LIGHT WARRANTY

The Pierce 12 volt DC LED strip lights limited warranty certificate, WA0203, is included with this proposal.

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.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY

The Pierce device limited warranty certificate, WA0052, is included with this proposal.

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.

HYDRAULIC SYSTEM COMPONENTS WARRANTY

Aerial hydraulic system components will be provided with a five (5) year material and workmanship limited warranty.

HYDRAULIC SEAL WARRANTY

Aerial hydraulic seals will be provided with a three (3) year material and workmanship limited warranty.

A copy of the warranty certificates 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 proposal.

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 proposal.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce Goldstar gold leaf lamination limited warranty limited warranty certificate, WA0018, is included with this proposal.

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.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

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

Pierce manufacturing will provide a cab crash test certification with this proposal. The certification states that the cab must 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 100,000 lb. This value will be 450 percent of the ECE 29 criteria, which must be equivalent to the front axle rating up to a maximum of ten (10) metric tons.

- Side Impact

The cab will be subjected to dynamic preload with a 13,275-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of energy. This test will closely represent the forces a cab will see in a rollover incident.

- Frontal Impact

The cab will withstand a frontal force produced from 65,200 ft-lb of energy using a swing-bob type platen.

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.

CITY OF SANTA ROSA FIRE DEPARTMENT

Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

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 77 degrees Fahrenheit 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 72 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

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).

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Specifications For: One (1) Pierce Arrow XT 107' Ascendant Tractor Drawn Aerial
December 11, 2019 (Proposal #51211-19)

- 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).

END OF SPECIFICATION



**GOLDEN
STATE
FIRE APPARATUS**



Electrical Analysis

12/12/2019

Bid #: 825
Desc: Arrow XT 107' TDA
Customer: Santa Rosa Fire Department

Job #:
Sales Rep: Bauer, Jon
Organization: Golden State Fire Apparatus, Inc

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
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
0006825	Reel, Elect Cable, Hannay, 1600, (3) Wire		0.00	72.00	0.00
0010758	Flow Meter, Waterway, PAL, 110' Ascendant, MUX		0.00	0.00	0.50
0020670	ABS Wabco Brake System, Single Axle, Tiller		0.00	6.00	0.00
0032828	No PTO switch req'd - w/aerial piggyback		0.00	0.00	0.08
0051087	Control, Air Horn, Horn Ring, PS Chrome Push Button, Location		0.00	0.83	0.00
0067116	Bracket, Johnny Ray Swivel, 7 Lb. Rating		0.00	0.00	0.00
0079212	Batteries, (6) Exide Grp 31, 950 CCA each, SAE Posts		0.00	3.00	0.00
0081564	Alarm, Back-Up Warning, ECCO 505, 87db Constant		0.00	0.50	0.00
0505675	Light, Brake Lt, Additional, WIn, PSR00XRR LED		0.00	2.10	0.00
0540766	Lights, Side, WIn M6* LED, Colored Lens, 1st		0.00	2.70	1.80
0543751	Light, Do Not Move Apparatus		0.00	0.80	0.00
0544198	Control, Air Horn, Red, at Turntable		0.00	0.83	0.00
0544420	Handlts, (4) Streamlight Fire Vulcan, 44401 12v, Orange		0.00	0.50	0.00
0557219	Light, Locator, WIn L31H*F, LED, at Tip, PAL/PAP, 2lts		0.00	4.56	3.04
0561471	Lights, Backup, WIn M6BUW, LED, For Tail Lt Housing		0.00	3.20	0.00
0587935	Lights, Side, WIn RS*02ZCR, Horizontally Mntd/Rec in Rub Rail, 1st		0.00	0.00	4.00
0592586	Remote Start, Hydraulic Generator, PTO and Field - SAME SWITCH,		0.00	1.00	0.00
0594648	Intercom, 2-Way Fire Research ICA900 Hands Free		0.00	0.00	0.50
0601871	Heater/Defroster, Tiller Cab, Tiller 2002, Electric, Dual 12V		0.00	75.00	0.00
0603353	Air Conditioning, Arrow-XT 2010		0.00	0.00	80.20
0619608	Light, GTT, 794*M LED Multimode Opticom Emitter on Cab Roof,		0.00	0.03	0.00
0622422	Cab Lift, Elec/Hyd, Remote, Manual Override, Ctrl Loc, Batt Interlock,		0.00	180.00	0.00
0632401	Light, WIn, 12V PCPSM1* Pioneer LED Fld/Spt, Surface Mount 3rd		0.00	0.00	6.00
0635913	Turntable Walking Surface, Black		0.00	0.00	2.10
0640627	Light, WIn, 12V PCPSM1* Pioneer LED Fld/Spt, Surface Mount 2nd		0.00	0.00	6.00
0640629	Light, WIn, 12V PCPSM1* Pioneer LED Fld/Spt, Surface Mount 1st		0.00	0.00	6.00
0650434	Spotlight, Golight/RadioRay, Model 20**4, LED, 1 Lt		0.00	0.00	3.00
0653677	Lighting, Rung, LED, TecNiq, 4 Section, Base, Lower/Upper Mid, Fly		0.00	0.00	20.00
0653937	Flasher, Headlight Alternating		0.00	0.00	0.08
0666072	Lights, Tractor Scene, WIn M6ZC LED Rear of Cab 2lts		0.00	0.00	4.00
0680983	Lights, Door Interior Flash, 4 Dr Cab, Weldon 8401-0000-20 LED Strip		0.00	0.36	0.00
0744848	Light, Centering, On Cab Roof, Tiller, Collapsible 6"		0.00	0.00	1.44
0744972	Radio, AlpineDigital Media Receiver		0.00	0.00	4.00
0749207	Lights, WIn, S30M** 30" 12VDC, RS Body		0.00	0.00	22.50
0749209	Lights, WIn, S30M** 30" 12VDC, LS Body		0.00	0.00	22.50
0754220	Lights, Rear, WIn M6** LED, Features 1st		0.00	2.70	1.80
0768376	Light, Walking Surf, FRP Flood, LED, Qty, Loc Fet		0.00	0.00	0.00
0779165	Siren, Federal Q2B, Bat Dir		0.00	100.00	0.00
0790401	Control Stations, ASL Tiller, MUX, Color Display		0.00	0.00	4.26
0797189	Wiring, Spare, 4.8 A 12V DC, USB Termination Blue Sea 1045 1st		0.00	0.00	5.00
0798180	Intercom, David Clark, 6-Pos, 2-Radio, D,(O RPTT),3C,TC (Outboard		0.00	0.00	0.50
0043079	Heater/defroster, AXT	LM	0.00	0.00	12.10
0054701	Lights, Side Scene, Zico ZQL-SS-H7614 Brite Stainless Steel, Side,	LM	0.00	0.00	7.82
0548004	Wiring, Spare, 15 A 12V DC 1st	LM	0.00	0.00	30.00
0548006	Wiring, Spare, 15 A 12V DC 2nd	LM	0.00	0.00	15.00
0548007	Wiring, Spare, 15 A 12V DC 3rd	LM	0.00	0.00	15.00
0548009	Wiring, Spare, 20 A 12V DC 1st	LM	0.00	0.00	20.00
0548015	Wiring, Spare, 30 A 12V DC 1st	LM	0.00	0.00	30.00

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



Electrical Analysis

12/12/2019

Bid #: 825
Desc: Arrow XT 107' TDA
Customer: Santa Rosa Fire Department

Job #:
Sales Rep: Bauer, Jon
Organization: Golden State Fire Apparatus, Inc

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0678715	Compt, At Rear Between Tow Eyes, Smooth Alum Sngl Pan Door	LM	0.00	0.00	1.80
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
0031837	Compt, F/H, Trans Lap, LS Front, Tiller	NFPA	1.80	0.00	1.80
0031838	Compt, F/H, Trans Lap, RS Front, Tiller	NFPA	1.80	0.00	1.80
0040132	Compt, F/H, Trans Front, Lap, LS Center, Tiller	NFPA	1.80	0.00	1.80
0059809	Light, Marker, Weldon, 9186-1500 LED, Location	NFPA	0.20	0.00	0.00
0068703	Lights, Grote Supernova LED, Stabilizer Beam, (1) Set	NFPA	1.60	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
0534987	Lights, Clearance/Marker/ID, Rear, Truck-Lite 33050R LED 7Lts, Aerial	NFPA	0.35	0.00	0.00
0540701	Lights, Stabilizer Warn (1) Set, Wln M6* LED, Front Colored Lens	NFPA	1.80	2.70	0.00
0550599	Siren, Wln 295HFS2X Dual Amp w/Remote Recessed Head	NFPA	1.40	12.60	0.00
0559290	Cab, Arrow XT 2010, 6710 Raised Roof	NFPA	6.80	10.20	0.00
0564654	Lights, Rear Zone Lower, Wln M6* LED, Colored Lens, For Tail Light	NFPA	1.80	2.70	0.00
0564683	Lights, Tail, Wln M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir	NFPA	0.83	2.49	0.00
0567651	Cab Instruments, Ivory Gauges, Chrome Bezels, AXT MUX 2010	NFPA	1.26	0.00	0.00
0568012	Air Dryer, Wabco System Saver 1200, Heater, 2010	NFPA	7.81	0.00	0.00
0593195	Cab, Tiller	NFPA	1.60	30.40	0.00
0601972	Lights, Turntable Walkway, P25, LED	NFPA	0.35	0.00	0.00
0601973	Lights, Stabilizer Scene, (1) set, Truck-Lite 44042C, LED	NFPA	1.00	0.00	0.00
0602100	Lights, Torque Box Ladder Storage, Pierce LED Strip Lights, 2 Lts	NFPA	1.00	0.00	0.00
0607578	Compt,F/H Front/Rear Lap, FW Rear, PS Rear, 2" Raised Floor, Tiller	NFPA	1.80	0.00	1.80
0607579	Compt, F/H Front/Rear Lap, FW Rear, DS Rear, 2" Raised Floor, Tiller	NFPA	1.80	0.00	1.80
0607664	Lights, Side Zone Lower, Wln M6** LED, 15 Deg Brkt Frnt Lts, 3pr,	NFPA	5.40	8.10	0.00
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	NFPA	1.20	0.00	0.00
0617961	Wiper Control, 2-Speed with Intermittent, MUX, AXT/Dash CF	NFPA	2.10	8.40	0.00
0626850	Ladder Storage, Horizontally Hinged Lift Up Door, Painted, 130	NFPA	0.90	0.00	0.90
0632086	Compt, F/H, Trans Front, Lap, Ladder Blister Rear, PS Center, Tiller	NFPA	1.80	0.00	1.80
0634693	Light, Front Zone, Wln M6* LED, 6RB** LED, Q-Bezel 4lts	NFPA	3.56	5.34	0.00
0636260	Light, Dome, Wln, 60C*EGCS, Dual LED 1lt	NFPA	0.75	0.75	0.00
0642537	Trans, Allison 5th Gen, 4500 EVS PR, w/Prognostics, Arrow XT	NFPA	2.00	2.00	0.00
0644535	Lights, Step, P25 LED, Tiller 2002, Park Brk	NFPA	0.50	0.00	0.00
0647017	Light, Rear Zone Upper, Wln Rota-Beam R416*F LED Beacon	NFPA	4.50	0.00	0.00
0647632	Lights, Dome, Wln 60C*EGCS Dual LED 4 Lts	NFPA	3.00	3.00	0.00
0647929	Lights, Directional/Marker, Cab Front Side, Truck-Lite	NFPA	0.12	0.00	0.00
0648258	Light, Directional, Wln M6T LED Arrow, 15 Degree Angle Bracket,	NFPA	3.60	5.40	0.00
0648425	Light, Directional, Wln 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF	NFPA	0.70	0.70	0.00
0664481	Bracket, License Plate & Light, P25 LED	NFPA	0.07	0.00	0.00
0665700	Light, Slide-Out Pump Operator Step, Not Required	NFPA	0.65	0.00	0.00
0670920	Lights, Wln MPB* Micro LED Trk Lights Only, 2lts PAL	NFPA	7.00	0.00	0.00
0745027	Lightbar, Wln, Freedom IV, Rota-Bm, 92",	NFPA	8.80	4.20	13.76
0749661	Light, Roof Mt, Wln S72M**, 72" Cnt Feature	NFPA	0.32	0.00	18.68
0750542	Light, Directional/Marker, Intermediate, Truck-Lite 60421Y LED 2lts	NFPA	0.10	1.00	0.00
0754630	Compt,Single Tractor Reservoir,Single Door,F/D,Add'l Trans	NFPA	1.80	0.00	1.80
0755072	Aerial, 107' ASL, 750/500 Tip, 50 MPH Wind, Tiller	NFPA	5.00	0.00	0.00
0762396	Light, Turntable Console, Amdor AY-LB-12HW012, LED Strip Light	NFPA	0.20	0.00	0.00
0762413	Light, Boom Support, Amdor AY-LB-12HW012, 12" LED	NFPA	0.18	0.00	0.00
0763582	DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle, Tiller	NFPA	0.60	11.40	0.00
0768492	Lights, Perimeter Body, Amdor AY-LB-12HW012 & 020 LED 4lts, Tiller	NFPA	1.08	0.00	0.00

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



Electrical Analysis

12/12/2019

Bid #: 825
Desc: Arrow XT 107' TDA
Customer: Santa Rosa Fire Department

Job #:
Sales Rep: Bauer, Jon
Organization: Golden State Fire Apparatus, Inc

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0769420	Lights, Perimeter Cab, Amdor AY-LB-12HW020 LED 4Dr	NFPA	1.20	0.00	0.00
0769570	Lights, Perimeter, Amdor AY-LB-12HW020 20" LED, Brkt	NFPA	1.20	0.00	0.00
0782103	Lights, Clearance/Marker/ID, Front, Included with Visor Scene Light	NFPA	0.35	0.00	0.00
0783157	Headlights, Rect LED, JW Spkr Evo 2, Heat,	NFPA	6.60	6.60	0.00
0789327	Light, Traffic Directing, WIn TAZ86, 30.87" Long TACTL5 Cnt LED	NFPA	1.50	4.50	0.00
0795516	Engine, Cummins X15, 600 hp, 1850 lb-ft, W/OBD, EPA 2017, Arrow	NFPA	10.00	0.00	0.00
0647728	Alternator, 430 amp, Delco Remy 55SI	S	0.00	0.00	0.00
Load Totals:			120.32	581.95	376.96

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: 254.00

Minimum Continuous Load	
Supply:	254.00
Demand:	120.32
Variance:	133.68

Alternator Output at Governed Speed: 370.00

Total Connected Load	
Supply:	370.00
Demand:	365.56
Variance:	4.44

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



GOLDEN STATE

FIRE APPARATUS

PROPOSAL PREPARED FOR

City of Santa Rosa

Fire Department

Pierce Manufacturing, Inc.

Arrow XT 107' TDA Aerial

December 11, 2019

HGAC Interlocal Contract #10-2428

Pierce HGAC Contract #FS12-19

SALES CONSULTANT

Jon Bauer

Golden State Fire Apparatus, Inc.

7400 Reese Road

Sacramento, CA 95828

916.330.1638 Office

530.351.2151 Cell

jbauer@goldenstatefire.com

PARTS, SERVICE & SUPPORT

Golden State Emergency Vehicle Service, Inc.

7400 Reese Road

Sacramento, CA 95828

916.330.1638 Office

parts@goldenstatefire.com



www.goldenstatefire.com
7400 Reese Road
Sacramento, CA 95828
Office 916.330.1638
Fax 916.330.1649

PROPOSAL PREPARED FOR:

City of Santa Rosa Fire Department
2373 Circadian Way
Santa Rosa, CA 95407

Submitted Date:	December 11, 2019
Proposal Number:	51211-19A
Expiration Date:	January 31, 2020
Sales Consultant:	Jon Bauer

Pursuant to this proposal (the "Proposal"), Golden State Fire Apparatus, Inc. ("GSFA") hereby proposes to furnish City of Santa Rosa Fire Department ("Customer"), the following fire apparatus and equipment, hereinafter called the "Product":

OPTION "A" - 100% PRE-PAYMENT AT TIME OF ORDER

#	Description	Price
A	One (1) Pierce Manufacturing, Inc. Arrow XT 107' Ascendant Tractor Drawn Aerial	1,409,332.52
B	Discount HGAC Consortium Purchase – Product Code FS19VA11	(46,250.32)
C	Discount For 100% Pre-Payment at Time of Order	(49,593.04)
SUBTOTAL		1,313,489.16
9.00% State Sales Tax		118,214.02
California Tire Fee		14.00
GRAND TOTAL		1,431,717.18

PROPOSAL SUMMARY

This Proposal includes the following items in accordance with the specifications hereto attached:

- Fire apparatus and equipment
- Pre-construction conference at customer location
- Factory construction review inspection
- Factory final inspection
- Delivery to GSFA service center in Sacramento
- Pre-delivery inspection/services by GSFA
- Final delivery from service center to Customer
- Demonstration and familiarization of the Product
- California Tire Fee

PRODUCT COMPLETION

The Product shall be built in accordance with the specifications hereto attached within approximately 300 to 345 calendar days after Customer's acceptance of this Proposal, subject to the force majeure provisions contained in the Purchase Agreement (defined below). The Purchase Agreement shall further describe the delivery schedule for the Product.

DELIVERY LOCATION

Product shall be shipped in accordance with the specifications hereto attached and be delivered to you at SANTA ROSA, CALIFORNIA. Prior to final delivery of the Product to Customer, Customer agrees to provide proof of liability and physical damage insurance to GSFA. GSFA shall not deliver the Product until such proof of insurance is provided.

ACCEPTING THIS PROPOSAL

In the event Customer wishes to purchase the Product described in this Proposal and the attached specifications, then, prior to the expiration date listed on page 2 of this Proposal, Customer shall sign and return this Proposal. Thereafter, GSFA and Customer will endeavor to enter into a purchase agreement incorporating this Proposal and including additional terms (a "Purchase Agreement"). If Customer returns a signed copy of this Proposal alone, GSFA will send Customer its form of Purchase Agreement for Customer's review and signature. If Customer desires to use its standard form of purchase order as the Purchase Agreement, then Customer should return a signed copy of this Proposal along with a copy of such purchase order. **All purchase orders shall be made out to GSFA.** GSFA will review such purchase order and contact the Customer regarding any required revisions. Only upon a full execution of a Purchase Agreement shall GSFA and Customer be obligated to purchase and sell the Product set forth in this Proposal.

TERMS AND CONDITIONS

The following Terms and Conditions are hereby made part of this Proposal:

- 1. Payment Terms, Payment within 15 Calendar Days of Contract Signing** – Customer shall pay the Grand Total within 15 Calendar Days of Contract Signing to GSFA. It is the responsibility of the Customer to have full payment ready within this timeframe. If payment is late or delivery is delayed pending payment, a daily finance charge of \$150.00 and a daily storage fee of \$50.00 may apply until such payment is received. Due to insurance liability, the Product(s) will not be left at the Customer's location without full acceptance and payment or prior written agreement between the Customer and GSFA.
- 2. Multiple Unit Purchase** – If the Purchase Price includes pricing for multiple units, the price stated on this Proposal shall only be valid if the quantity of Products being proposed are purchased at the same time, pursuant to the same Purchase Agreement.
- 3. Stock / Demo Units** – If applicable, any stock/demo units, including those identified by this Proposal, are available for sale on an as-is, first-come and first served-basis. Regardless of this Proposal, the first Customer to enter into a Purchase Agreement identifying any such stock/demo units shall obtain said units.
- 4. Order Changes** – The Customer may request that GSFA incorporate a change to the Product or the Specifications for the Product by delivering a written change order to GSFA, which shall include a description of the proposed change sufficient to permit GSFA to evaluate the feasibility of such change (a "Change Order"). GSFA will provide Customer a written response (a "Response") stating (i) whether GSFA will accommodate such Change Order (which GSFA may decide in its sole and absolute discretion) and (ii) the terms of the modification to the order, including any increase or decrease in the Purchase Price resulting from such Change Order, and any effect on production scheduling or Delivery resulting from such Change Order. Customer shall have seven (7) days after receipt of the Response to notify GSFA as to whether Customer desires to make the changes GSFA has approved in the Response. In the event Customer counter-signs GSFA's Response, Customer shall pay the increase (or be refunded the decrease) in the Purchase Price prior to final delivery to Customer location.
- 5. Force Majeure** – GSFA shall not be responsible nor deemed to be in default on account of delays in performance due to causes which are beyond GSFA's and manufacturer's control and which make GSFA's performance impracticable, including but not limited to wars, insurrections, strikes, riots, fires, storms, floods, other acts of nature, explosions, earthquakes, accidents, any act of government, delays in transportation, inability to obtain necessary labor supplies or manufacturing facilities, allocation regulations or orders affecting materials, equipment, facilities or completed products, failure to obtain any required license or certificates, acts of God or the public enemy or terrorism, failure of transportation, epidemics, quarantine restrictions, failure of vendors (due to causes similar to those within the scope of this clause) to perform their contracts or labor troubles causing cessation, slowdown, or interruption of work.
- 6. Cancellation/Termination** – In the event Customer and GSFA enter into a Purchase Agreement and Customer thereafter cancels or terminates the Purchase Agreement, GSFA will charge a cancellation fee as follows: (a) 10% of the Purchase Price after order is accepted and entered by GSFA; (b) 20% of the Purchase Price after completion of the pre-construction phase of the order process; and (c) 50% of the Purchase Price after the requisition of any materials or commencement of any manufacturing or assembly of the Product by either GSFA or the manufacturer of the Product. The tier of cancellation fee applicable to any cancellation shall be in the sole and absolute discretion of GSFA.
- 7. State Sales Tax** – Customer shall be responsible for the cost of state sales tax associated with, or attributable to the Product. The taxes owed by Customer for the Product is subject to adjustment for the applicable state sales tax rate in effect when the Product is delivered to the Customer. Therefore, the sales tax will be increased or decreased at the time of delivery if a change in the sales tax rate has occurred, in which case Customer shall pay GSFA (or be refunded by GSFA) the applicable change in sales tax.
- 8. Proposal Expiration** – After the Expiration Date shown on page one of this Proposal, Customer shall require GSFA's written consent to accept this Proposal.
- 9. Governing Law** – This Proposal is to be governed by and under the laws of the state of California.

Thank you for providing Golden State Fire Apparatus, Inc. with the opportunity to provide this proposal. If you have any questions regarding the options presented or need additional options, please contact me.

Sincerely,



Jon Bauer

Golden State Fire Apparatus, Inc.



**GOLDEN
STATE**
FIRE APPARATUS

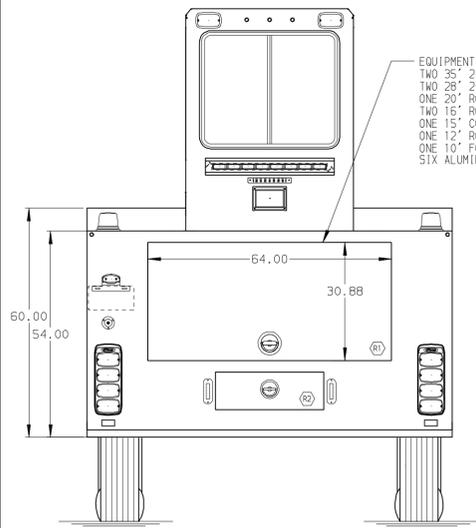
www.goldenstatefire.com
7400 Reese Road
Sacramento, CA 95828
Office 916.330.1638
Fax 916.330.1649

I, _____ authorized representative of the CITY OF SANTA ROSA agrees to purchase the proposed Product(s) and agree to the terms and conditions of this proposal and the specifications hereto attached.

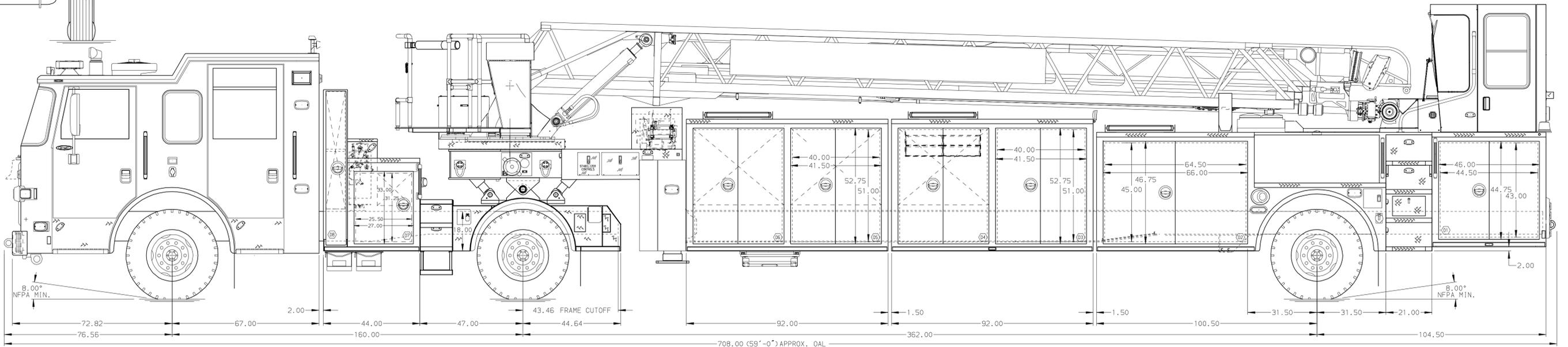
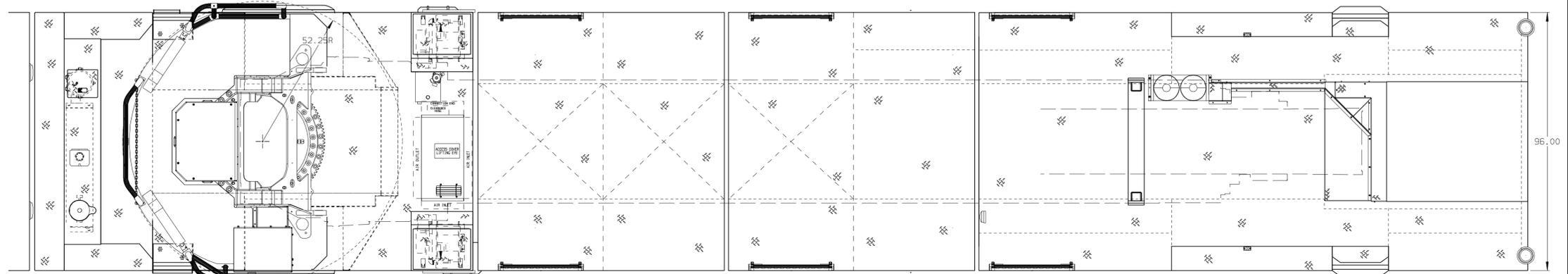
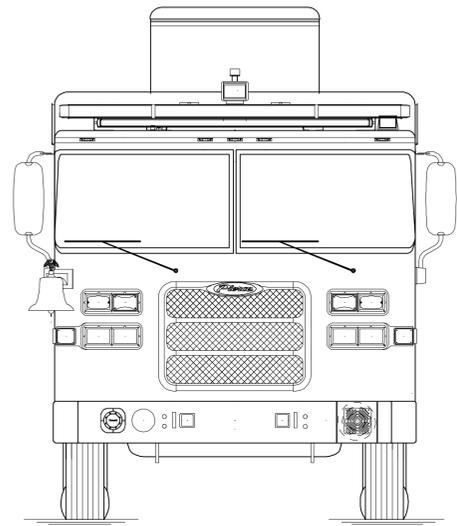
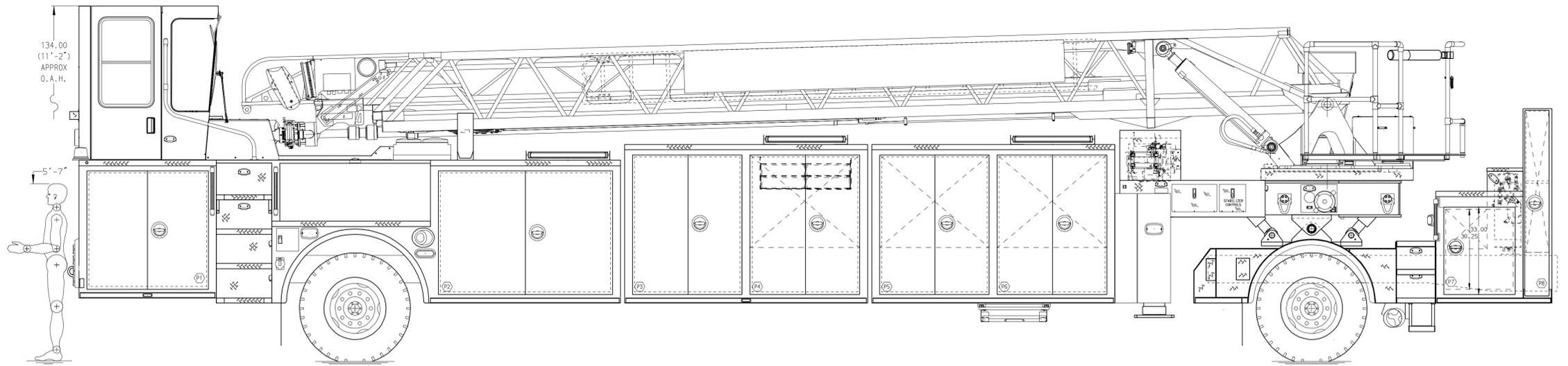
SIGNATURE: _____

TITLE: _____

DATE: _____



EQUIPMENT STORED IN R1:
 TWO 35" 2-SEC 1200A
 TWO 28" 2-SEC 1200A
 ONE 20" ROOF 875A
 TWO 16" ROOF 875A
 ONE 15" COMBO 300A
 ONE 12" ROOF 775A
 ONE 10" FOLDING 585A
 SIX ALUMINUM PIKE POLE TUBES



ALUMINUM BODY MAXIMUM O.A.H. 134.00" MAXIMUM O.A.L. 708.00"

NOTE
 DIMENSIONS SHOWN ARE APPROXIMATE
 AND ARE SUBJECT TO MINOR DEVIATIONS
 AS MAY OCCUR OR BE NECESSARY IN
 CONSTRUCTION.
 MINOR DETAILS NOT SHOWN.

REV	DATE	BY	CH

	TITLE	100' HSL TDA AERIAL LADDER AND BODY ASSEMBLY	JOB NO.	PRELIM
	MAKE	NO PUMP/NO TANK	SCALE	DATE
FOR	SANTA ROSA FIRE DEPARTMENT	BID#825	DRAWN BY	LWE
	GOLDEN STATE FIRE APPARATUS	BAUER, JON	CHECKED BY	-
DWG NO.	04-6584		SHEET SIZE	D
			SHEET NO.	1 OF 1

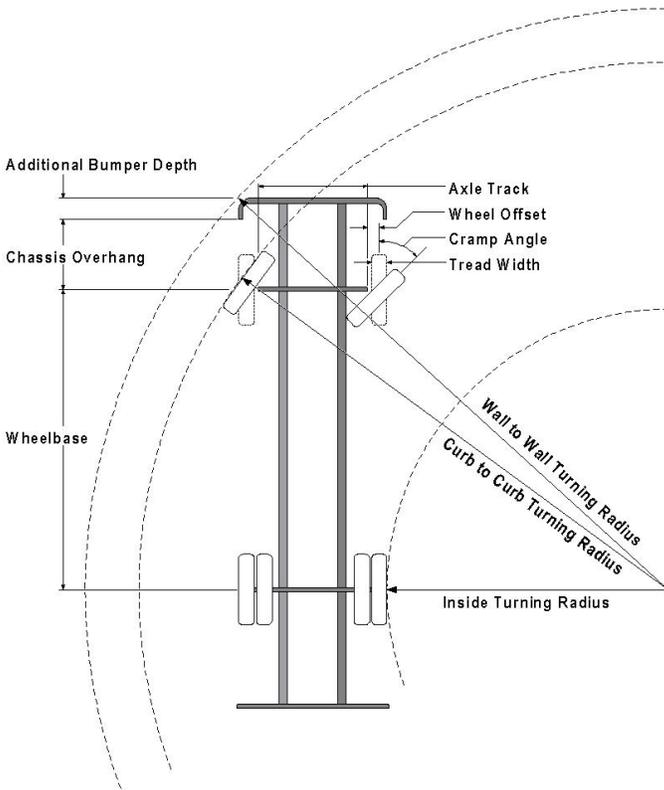


Turning Performance Analysis

12/12/2019

Bid Number: 825
Department: Santa Rosa Fire Department

Chassis: Arrow XT Chassis, Tractor (Tiller)
Body: Aerial, Tiller, Alum Body



Parameters:

*Inside Cramp Angle:	45°
Axle Track:	84.42 in.
Wheel Offset:	4.68 in.
Tread Width:	15.9 in.
Chassis Overhang:	68.99 in.
Additional Bumper Depth:	5 in.
Front Overhang:	73.99 in.
Wheelbase:	160 in.

Calculated Turning Radii:

Inside Turn:	12 ft. 3 in.
Curb to curb:	25 ft. 5 in.
Wall to wall:	28 ft. 0 in.

Category	Option	Description
Axle, Front, Custom	0530441	Axle, Front, Meritor FL-943, 18,740 lb, w/o assist, AXT
Wheels, Front	0019611	Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot
Tires, Front	0677584	Tires, Front, Goodyear, G296 MSA, 385/65R22.50, 18 ply, Fire Service Load Rating
Bumpers	0622822	Bumper, Non-Extended, Steel, Painted, 10" High, Special Reduced Length, Arrow XT
Aerial Devices	0755072	Aerial, 107' ASL, 750/500 Tip, 50 MPH Wind, Tiller

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.



Fire and Rescue Apparatus

One (1) Year Material and Workmanship

Basic Apparatus

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Portions of the apparatus manufactured by Pierce shall be free from defects in material and workmanship
Warranty Begins:	The date the apparatus is placed in service, or 60 days from the original buyer invoice date, whichever comes first.
Warranty Period Ends After:	Twelve (12) months.
Conditions and Exclusions: See Also Paragraphs 2 thru 4	No specific exclusions apply

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

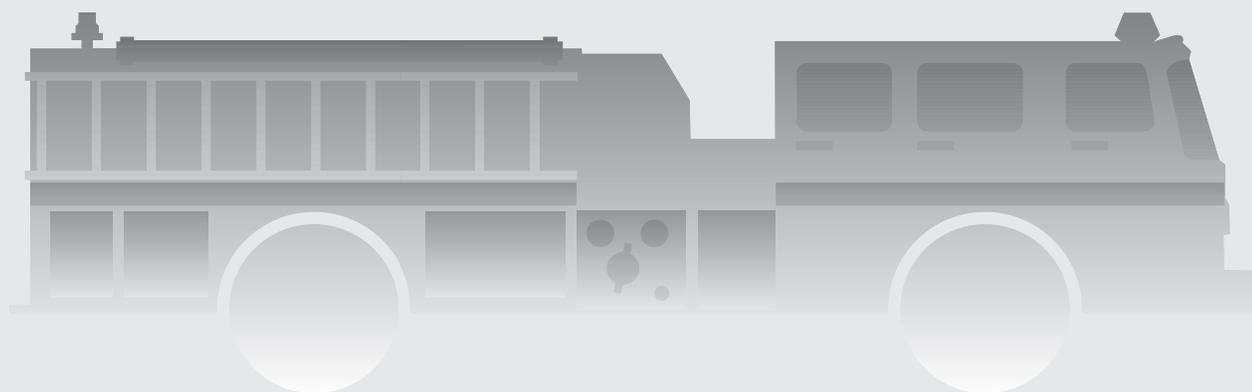
Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Cummins Warranty

Worldwide

Fire Apparatus/Crash Trucks



Coverage

Products Warranted

This Warranty applies to new diesel Engines sold by Cummins and delivered to the first user on or after April 1, 2007, that are used in fire apparatus truck and crash truck* applications Worldwide.

Base Engine Warranty

The Base Engine Warranty covers any failures of the Engine which result, under normal use and service, from a defect in material or factory workmanship (Warrantable Failure). This Coverage begins with the sale of the Engine by Cummins and ends five years or 100,000 miles (160,935 kilometers), whichever occurs first, after the date of delivery of the Engine to the first user.

Engine aftertreatment components included in the Cummins Critical Parts List (CPL) and marked with a Cummins part number are covered under Base Engine Warranty.

Additional Coverage is outlined in the Emission Warranty section.

These Warranties are made to all Owners in the chain of distribution and Coverage continues to all subsequent Owners until the end of the periods of Coverage.

Cummins Responsibilities

Cummins will pay for all parts and labor needed to repair the damage to the Engine resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses and other maintenance items that are not reusable due to the Warrantable Failure.

Cummins will pay for reasonable labor costs for Engine removal and reinstallation when necessary to repair a Warrantable Failure.

Cummins will pay reasonable costs for towing a vehicle disabled by a Warrantable Failure to the nearest authorized repair location. In lieu of the towing expense, Cummins will pay reasonable costs for mechanics to travel to and from the location of the vehicle, including meals, mileage and lodging when the repair is performed at the site of the failure.

Owner Responsibilities

Owner is responsible for the operation and maintenance of the Engine as specified in Cummins Operation and Maintenance Manuals. Owner is also responsible for providing proof that all recommended maintenance has been performed.

Before the expiration of the applicable Warranty, Owner must notify a Cummins distributor, authorized dealer or other repair location approved by Cummins of any Warrantable Failure and make the Engine available for repair by such facility. Except for Engines disabled by a Warrantable Failure, Owner must also deliver the Engine to the repair facility.

Service locations are listed on the Cummins Worldwide Service Locator at cummins.com.

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items provided during Warranty repairs unless such items are not reusable due to the Warrantable Failure.

Owner is responsible for communication expenses, meals, lodging and similar costs incurred as a result of a Warrantable Failure.

Owner is responsible for non-Engine repairs and for "downtime" expenses, cargo damage, fines, all applicable taxes, all business costs and other losses resulting from a Warrantable Failure.

Owner is responsible for a \$100 (U.S. Dollars) deductible per each service visit under this plan in the 3rd, 4th and 5th years of Base Engine Warranty. The deductible will not be charged during the first 2 years of the Base Engine Warranty.

Limitations

Cummins is not responsible for failures or damage resulting from what Cummins determines to be abuse or neglect, including, but not limited to: operation without adequate coolants or lubricants; overfueling; overspeeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the Engine.

Any unauthorized modifications to the aftertreatment could negatively effect emissions certification and void Warranty.

Cummins is also not responsible for failures caused by incorrect oil, fuel or diesel exhaust fluid or by water, dirt or other contaminants in the fuel, oil or diesel



exhaust fluid.

This Warranty does not apply to accessories supplied by Cummins which bear the name of another company. Such non-warranted accessories include, but are not limited to: alternators, starters, fans, air conditioning compressors, clutches, filters, transmissions, torque converters, vacuum pumps, power steering pumps, fan drives and air compressors. Cummins branded alternators and starters are covered for the first two years from the date of delivery of the Engine to the first user, or the expiration of the Base Engine Warranty, whichever occurs first.

Failures resulting in excessive oil consumption are not covered beyond the duration of the Coverage or 100,000 miles (160,935 kilometers) or 7,000 hours from the date of delivery of the Engine to the first user, whichever of the three occurs first. Before a claim for excessive oil consumption will be considered, Owner must submit adequate documentation to show that consumption exceeds Cummins published standards.

Failures of belts and hoses supplied by Cummins are not covered beyond the first year from the date of delivery of the Engine to the first user or the duration of the Warranty, whichever occurs first.

Parts used to repair a Warrantable Failure may be new Cummins parts, Cummins approved rebuilt parts or repaired parts. Cummins is not responsible for failures resulting from the use of parts not approved by Cummins.

A new Cummins or Cummins approved rebuilt part used to repair a Warrantable Failure assumes the identity of the part it replaced and is entitled to the remaining Coverage hereunder.

Cummins Inc. reserves the right to interrogate Electronic Control Module (ECM) data for purposes of failure analysis.

CUMMINS DOES NOT COVER WEAR OR WEAROUT OF COVERED PARTS.

CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

THIS WARRANTY AND THE EMISSION WARRANTY SET FORTH HEREINAFTER ARE THE SOLE WARRANTIES MADE BY CUMMINS IN REGARD TO THESE ENGINES. CUMMINS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Emission Warranty

Products Warranted

This Emission Warranty applies to new Engines marketed by Cummins that are used in the United States** in vehicles designed for transporting persons or property on a street or highway. This Warranty applies to Engines delivered to the first user on or after September 1, 1992.

Coverage

Cummins warrants to the first user and each subsequent purchaser that the Engine is designed, built and equipped so as to conform at the time of sale by Cummins with all U.S. federal emission regulations applicable at the time of manufacture and that it is free from defects in material or factory workmanship which would cause it not to meet these regulations within the longer of the following periods: (A) Five years or 100,000 miles (160,935 kilometers) of operation, whichever occurs first, as measured from the date of delivery of the Engine to the first user or (B) The Base Engine Warranty.

If the vehicle in which the Engine is installed is registered in the state of California, a separate California Emission Warranty also applies.

Limitations

Failures, other than those resulting from defects in material or factory workmanship, are not covered by this Warranty.

Cummins is not responsible for failures or damage resulting from what Cummins determines to be abuse or neglect, including, but not limited to: operation without adequate coolants or lubricants; overfueling; overspeeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the Engine.

Any unauthorized modifications to the aftertreatment could negatively effect emissions certification and void Warranty.

Cummins is also not responsible for failures caused by incorrect oil, fuel or diesel exhaust fluid or by water, dirt or other contaminants in the fuel, oil or diesel exhaust fluid.

Cummins is not responsible for non-Engine repairs, "downtime" expenses, cargo damage, fines, all applicable taxes, all business costs or other losses resulting from a Warrantable Failure.

**CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL
OR CONSEQUENTIAL DAMAGES.**

* Airport operated crash trucks and fire department
operated trucks employed to respond to fires,
hazardous material releases, rescue and other
emergency-type situations.

** United States includes American Samoa, the
Commonwealth of Northern Mariana Islands, Guam,
Puerto Rico and the U.S. Virgin Islands.



Cummins Inc.
Box 3005
Columbus, IN 47202-3005
U.S.A.

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TRW COMMERCIAL STEERING SYSTEMS
800 HEATH STREET
LAFAYETTE, INDIANA 47904



PRODUCT WARRANTY

- I. WARRANTY:** The Commercial Steering Systems group of TRW, Inc., hereinafter referred to as "CSS", warrants that each new product supplied by CSS to its customer, when properly installed, used and maintained, shall be free from defect in material and workmanship for the period specified below:
- (A) CSS Product installed in **New On-highway Motor Vehicle:**
- Within twelve (12) months after date of delivery of such vehicle to the original retail purchaser, or before such vehicle has been driven one hundred thousand (100,000) miles, whichever event shall first occur.
- (B) CSS Product installed in **New Agricultural, Turf, Industrial, or Construction Vehicles and Related Equipment**
- Within twelve (12) months after date of delivery of such vehicle/equipment to the original retail purchaser or before such vehicle/equipment has been operated for two thousand (2000) hours or fifty thousand (50,000) miles, whichever occurs first.
- (C) CSS Product installed in **New End Product, Not Specifically Mentioned in Classifications (A) or (B) Above and All Other Off-Highway/Severe Applications:**
- Within six (6) months after date of delivery of the original equipment manufacturer's end product to the original retail purchaser.
- II. REMEDY:** Customer's sole remedy under the foregoing warranty is limited to correction by means of repair, replacement or issuance of credit, at the option of CSS, of any product which is:
- (A) Returned to CSS within the specified warranty time period, with prior notice to, and the written consent of, CSS, with transportation and handling charges prepaid, together with a statement describing the alleged defect, the part number, model number and application, and mileage or hours of use of such product; and
- (B) Upon examination, determined by CSS not to conform to the warranty.
- III.** Any product which is repaired or replaced under this warranty will be returned to customer prepaid. Disposition of any product determined not to be covered by this warranty will be at the customer's expense.
- IV.** CSS will not be liable for any repairs, replacements, or adjustments to any product or any cost of labor performed by or at the request of customer without the express prior written consent of CSS.
- V. EXCEPTIONS:** The provision of this warranty shall not apply to any CSS product which is used for a purpose for which it is not designed, or which shall have been repaired or altered in any way, or which has been subject to misuse, negligence or accident, neglect of normal maintenance services, so as, in the judgement of CSS to adversely affect its performance and reliability. In no case will the CSS warranty exceed the standard published warranty of its customer in terms of time and/or distance. In all events, the CSS warranty will expire thirty (30) months after the date of manufacture as stamped on the Product. In the case of hydraulic equipment, operation with unapproved fluid or temperatures voids this warranty.
- VI. EXCLUSION OF ALL OTHER REMEDIES AND LIMITATION OF LIABILITY:** Customer's sole and exclusive remedy under the foregoing warranty shall be for the repair, replacement or issuance of credit with respect to a defective product, as set forth and described above. Other provisions hereof notwithstanding, CSS shall not be liable to Customer, or any successor in interest, beneficiary or assignee of Customer, based upon any claim against CSS, whether in contract, warranty, negligence, strict liability, indemnity or otherwise, for any special, consequential, incidental or other damages relating in any way to the design, manufacture, sale, installation or other use of any product purchased from CSS.
- VII. EXCLUSION OF ALL OTHER WARRANTIES: THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY BY CSS AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES AND REPRESENTATIONS, WHETHER ORAL, WRITTEN, EXPRESSED, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**



Fire and Rescue Apparatus

Lifetime Fifty (50) Year Structural Integrity Custom Chassis Frame Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Custom chassis frame rail manufactured by Pierce shall be free from defects in material and workmanship
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Fifty (50) Years (Expected Life of Apparatus)
Conditions and Exclusions: See Also Paragraphs 2 thru 4	This warranty does not apply to damage caused by corrosion.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Fire and Rescue Apparatus

Two (2) Year Material and Workmanship

Meritor Axles

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	The Meritor axle shall be covered by Meritor as indicated in the attached Meritor warranty coverage description
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Two (2) Year
Conditions and Exclusions: See Also Paragraphs 2 thru 4	The exclusions listed in the attached Meritor warranty description shall apply.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY.

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES.

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

MERITOR® COMMERCIAL VEHICLE SYSTEMS

WARRANTY/MODEL YEAR 2018 VEHICLES



MERITOR





WARRANTY INFORMATION CONTENTS

Effective Model Year 2018 Vehicles

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How to Read Warranty Coverage

Number of Years	Mileage (in thousands) Unl=Unlimited	P=Parts Only P&L=Parts & Labor
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Notice:

Models or components that are approved for use by Meritor’s vocational guidelines contained in Meritor Publication TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, which are not specifically listed, are warranted for one year, unlimited miles, parts only (1/Unl/P).

Products purchased on an incomplete vehicle (glider) are limited to one year, unlimited miles parts only (1/Unl/P).

Advantage Program

Purchasing additional coverage on select components will continue to safeguard your investment against major repair costs after the initial base coverage expires. You can find out more about the Advantage Program by visiting www.meritor.com or by contacting Meritor at 866-OnTrac1 (866-668-7221).



LINEHAUL WARRANTY INFORMATION

Linehaul Vehicles

- Auto Hauler
- Bulk Hauler
- Chip Hauler (Truck)*
- Doubles
- Flatbed
- General Freight
- Grain Hauler
- Livestock Hauler
- Moving Van
- Pipe Hauler
- Refrigerated Freight
- Tanker
- Triples

* Chip Hauler vehicles require specific axle models listed below and Linehaul condition to be eligible for Linehaul warranty consideration.

Linehaul Typically Is

- High mileage operation (over 60,000 miles/year)
- Well maintained major highways of concrete or asphalt construction
- Greater than 30 miles between starting and stopping

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Front Non-Drive Steer Axles – 5/750/P&L

FD-965	FF-966	MFS-10-144A-N	MFS-12-132C-N	MFS-13-122C-N	MFS-14-143A-N
FF-941	FF-967	MFS-12-122A-N	MFS-12-143A-N	MFS-13-132B-N	
FF-942	FG-941	MFS-12-122B-N	MFS-12E-143A-N	MFS-13-132C-N	
FF-943	FG-943	MFS-12-122C-N	MFS-12-144A-N	MFS-13-143A-N	
FF-944	MFS-10-122A	MFS-12E-122A-N	MFS-13-122A-N	MFS-13-144A-N	
FF-961	MFS-10-143A-N	MFS-12-132B-N	MFS-13-122B-N	MFS-14-122A-N	

Rear Drive Single Axles – 5/750/P&L

RS-19-144/145/A	RS-21-160
MS-19-14X	RS-23-160
MS-21-144	RS-23-161
RS-21-145	RS-23-186

Rear Drive Tandem/Tridem Axles – 5/750/P&L

RT-34-144/P/A	MA-40-165	MT-40-943
RT-40-145/A	MA-40-175	MT-40-943-SP
RT-40-160/P ^{1,2}	MT-34-14X/P	RZ-166 ²
RT-46-160/P ^{1,2}	MT-40-14X/P	RZ-188
RT-46-164EH/P ^{1,2}	MT-40-14X/P	
RT-50-160/P ^{1,2}	MT-40-144/P	

Drivelines

RPL	5/500/P, 1/Unl/P&L
MXL	3/350/P, 1/Unl/P&L
155N	1/Unl/P
92N	1/Unl/P

¹ These models required for Chip Hauler and Linehaul warranty consideration.
² Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.



LINEHAUL WARRANTY INFORMATION

Brake Components

Cam Q Series Trailer Brakes	5/500/P, 1/100/L
LX500 Feature ¹	5/750/P&L
Q+ Drum Brake™	5/500/P, 1/Unl/P&L
ASA	5/500/P, 1/Unl/P&L
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P
STEELite X30 Drum Brake™ ²	12-Years or Wearable Life/P
EX+ Air Disc Brake™	5/500/P, 1/Unl/L

¹ Includes: bushing, seal, cam, ASA lubrication and wear coverage of 3/500/P&L.

² Based on stamped wear diameter max.

Trailer Axles

Beam and Brackets	5/500/P, 1/100/L
Wheel End Systems ¹	
Standard System ²	1/100/P&L
PreSet by Meritor ³	5/500/P&L
AxlePak ⁴	5P/L
AxlePak ⁵	7P/L

¹ Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

² When installed by Meritor.

³ Requires approved hubcap stating PreSet by Meritor on hubcap face.

⁴ When specified with AxlePak5 wheel end system, coverage on MTIS thru-tee and stator is 5/500P, 3/500L.

⁵ When specified with AxlePak7 wheel end system, coverage on MTIS thru-tee and stator is 7/750P, 3/500L.

(For brake components and ABS coverage, refer to appropriate product warranties.)

TAG/Pusher Axles¹

TQ, TQD, TR, TRD Beam and Brackets	5/750/P&L
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¹ For brake components and ABS Coverage, refer to appropriate product warranties.

Meritor Tire Inflation System by PSI

MTIS Components	3/500/P&L
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Trailer Air Suspension Systems

MPA38/40 (Tandem Axle Parallelogram) ¹	
Major Structural Components	5/500/P, 1/100/L
Curbing Damage Warranty ²	5/500/P, 1/100/L
Height Control Valve	1/100/P&L
Shock Absorbers	2/200/P&L
Air Springs	2/200/P, 1/100/L
Bushings	7/700/P, 5/500/L
PinLoc Air Controls	1/100/P&L
PinLoc Actuator	3/300/P&L
MPA20 (Single Axle Parallelogram)	
Major Structural Components	5/500/P, 1/100/L
Height Control Valve	1/100/P&L
Shock Absorbers	2/200/P&L
Air Springs	2/200/P, 1/100/L
Bushings	7/700/P, 5/500/L
MTA (Trailing Arm)	
Major Structural Components	5/500/P, 1/100/L
Height Control Valve	1/100/P&L
Shock Absorbers	2/200/P&L
Air Springs & Rebound Straps	2/200/P, 1/100/L
Bushings	5/500/P, 3/300/L

¹ Fastener torque coverage is limited to 2/Unl P&L when torqued by Meritor (For axle and ABS coverage, refer to appropriate product warranties.)

² “Curbing damage” is defined as deformation (bending, buckling, or breakage), caused by sudden impact with a curb or similar fixed object. Damage to the RideSentry slider box (the suspension sliding subframe, consisting of the frame rails, crossmembers, and central A-frame assembly), caused by accidental trailer impact with a curb or similar fixed object, is eligible for warranty coverage. Damage to other components or damage resulting from collision with another vehicle, rollover or fire is not covered under this provision. Warranty is not transferrable to another trailer VIN, and coverage does not apply if the trailer is deemed to be a total loss, scrapped, or otherwise not salvageable.



GENERAL SERVICE WARRANTY INFORMATION

General Service Vehicles

- Aerial Ladder Truck
- Aerial Platform
- Ambulance
- Auto Hauler
- Beverage Truck
- Chip Hauler
- Cross Country Coach
- Flatbed
- Front Engine Commercial Chassis
- Front Engine Integral Coach
- General Freight
- Intercity Coach
- Intermodal Chassis
- Livestock Hauler
- Meat Packer
- Moving Van
- Municipal Truck
- Newspaper Delivery
- Pick-Up and Delivery
- Pipe Hauler
- Platform Auto Hauler
- Pumper
- Rear Engine Integral Coach
- Recreational Vehicles
- Refrigerated Freight
- School Bus
- Stake Truck
- Tanker
- Tanker Truck
- Tour Bus
- Wrecker

General Service Typically Is

- Lower mileage operations (less than 60,000 miles/year)
- Generally, on-road service (less than 10% off-road)
- An average of three (3) miles between starting and stopping

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Front Drive/Non-Drive Steer Axles – 2/Uni/P&L

FD-965	FH-941	MFS-7-153C-N	MFS-12E-122A-N	MFS-13-122C-N	MFS-18-135A-N
FF-941	FH-946 ¹	MFS-7-163C-N	MFS-12-122B-N	MFS-13-132B-N	MFS-18-193A-N
FF-942	FL-941	MFS-8-113B-N	MFS-12-122C-N	MFS-13-132C-N	MFS-20-133A-N
FF-943	FL-943	MFS-8-143A-N	MFS-12-132B-N	MFS-13-143A-N	MFS-20-135A-N
FF-944	MFS-6-151A-N	MFS-8-153B-N	MFS-12-132C-N	MFS-13-144A-N	MFS-20H-193A-N
FF-946	MFS-6-153B-N	MFS-8-163B-N	MFS-12-143A-N	MFS-14-122A-N	MFS-22H-135A-N
FF-961	MFS-6-162B-N	MFS-10-122A	MFS-12-144A-N	MFS-14-143A-N	MFS-22H-193A-N
FF-966	MFS-6-153C-N	MFS-10-143A-N	MFS-12E-143A-N	MFS-16-122A-N	
FF-967	MFS-6-162C-N	MFS-10-144A-N	MFS-13-122A-N	MFS-16-143A-N	
FG-941	MFS-7-113C-N	MFS-12-122A-N	MFS-13-122B-N	MFS-18-133A-N	

¹ Can also be used with reduced steer angles in tag position in Coach Applications.

Rear Drive Single Axles – 2/Uni/P&L

MS-17-13X	MS-21-144	RC-23-162 ¹	MS-26-616	79163
MS-17-14X	MS-23-17X	RC-23-165 ¹	MS-26-616-SP	
MS-19-13X	RS-21-145/A	RS-23-160	RS-30-185	
MS-19-14X	RS-21-160	RS-23-161	MS-30-616	
RS-17-144/145/A	RC-22-145	RS-23-186	MS-30-616-SP	
RS-19-144/145/A	RC-22-145/A	RS-24-160	RS-35-380	
MS-21-13X	RC-23-160	RC-25-160	71162	
MS-21-14X	RC-23-161	RS-26-185	71163	

¹ 3/Uni/P&L if PreSet by Meritor.

Rear Drive Tandem – 3/Uni/P&L

RT-40-160/P	RT-46-164EH/P
RT-46-160/P	RT-50-160/P

Drivelines

RPL	4/400/P, 1/Uni/P&L
MXL	3/350/P, 1/Uni/P&L
155N	1/Uni/P
92N	1/Uni/P

Rear Drive Tandem/Tridem Axles – 2/Uni/P&L

MT-34-14X/P	MT-44-14X/P	MT-58-616
RT-34-144/P/A	RT-44-145/P	RT-58-185 ¹
MT-40-14X/P	RT-46-169	MT-70-380
MT-40-144/P	MT-52-616	RZ-166
RT-40-145/A	RT-52-185 ¹	RZ-188

¹ Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.



GENERAL SERVICE WARRANTY INFORMATION

Brake Components

Cam Q Series Trailer Brakes	3/Unl/P, 1/Unl/L
LX500 Feature ¹	3/Unl/P&L
Cam P ³	2/200/P
Cam	3/Unl/P
Q+ Drum Brake™	3/Unl/P&L
Q+ Drum Brake™ ³	2/200/P&L
ASA	3/Unl/P
ASA ³	2/200/P
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P
STEELite X30 Drum Brake™ ²	12-Years or Wearable Life/P
EX+ Air Disc Brake™	2/Unl/P&L

¹ Includes: bushing, seal, cam, ASA lubrication and wear coverage of 1/Unl/P.

² Based on stamped wear diameter max.

³ Applies to Tour Bus and Cross Country Coach only.

Trailer Axles

Beam and Brackets ¹	5/Unl/P, 1/Unl/L
Wheel End Systems ²	
Standard System ³	1/Unl/P&L
AxlePak ⁴	5P/L
AxlePak ⁵	7P/L

¹ 9000 Series is 3/Unl/P, 1/Unl/L

² Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

³ When installed by Meritor.

⁴ When specified with AxlePak5 wheel end system, coverage on MTIS thru-tee and stator is 5/500P, 3/500L.

⁵ When specified with AxlePak7 wheel end system, coverage on MTIS thru-tee and stator is 7/750P, 3/500L.

(For brake components and ABS coverage, refer to appropriate product warranties.)

Chassis Axles (2000 Series/ChassiPak)

Beam & Brackets	6/Unl/P, 1/Unl/L
Wheel End Systems ¹	
Standard System	1/Unl/P&L
AxlePak ⁷	7P/L
Beam and Brackets	7P/1L

¹ Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

Trailer Air Suspension Systems

MPA38/40 (Tandem Axle Parallelogram) ¹	
Major Structural Components	5/Unl/P, 1/Unl/L
Curbing Damage Warranty ²	5/500/P, 1/100/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs	2/Unl/P, 1/Unl/L
Bushings	7/700/P, 5/500/L
PinLoc Air Controls	1/Unl/P&L
PinLoc Air Actuator	3/Unl/P&L
MPA20 (Single Axle Parallelogram)	
Major Structural Components	5/Unl/P, 1/Unl/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs	2/Unl/P, 1/Unl/L
Bushings	7/700/P, 5/500/L
MTA (Trailing Arm)	
Major Structural Components	5/Unl/P, 1/Unl/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs and Rebound Straps	2/Unl/P, 1/Unl/L
Bushings ³	5/Unl/P, 3/Unl/L

(For axle and ABS coverage, refer to appropriate product warranties.)

¹ Fastener torque coverage is limited to 2/Unl P&L when torqued by Meritor

² "Curbing damage" is defined as deformation (bending, buckling, or breakage), caused by sudden impact with a curb or similar fixed object. Damage to the RideSentry slider box (the suspension sliding subframe, consisting of the frame rails, crossmembers, and central A-frame assembly), caused by accidental trailer impact with a curb or similar fixed object, is eligible for warranty coverage. Damage to other components or damage resulting from collision with another vehicle, rollover or fire is not covered under this provision. Warranty is not transferrable to another trailer VIN, and coverage does not apply if the trailer is deemed to be a total loss, scrapped, or otherwise not salvageable.

³ Raw wood applications 3/Unl/P, 1/Unl/L

TAG/Pusher Axles

TQ, TQD, TR, TRD Beam and Brackets ¹	3/Unl/P, 1/Unl/L
MC12002, MC14002, MC16003, FH946	2/Unl/P&L

(For brake components and ABS coverage, refer to appropriate product warranties.)

¹ 3/UNL/P&L if sold with PreSet by Meritor.

Meritor® Tire Inflation System by PSI

MTIS Components	3/500/P&L
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HEAVY SERVICE WARRANTY INFORMATION

Heavy Service Vehicles

- Airport Rescue Fire (ARF)
- Airport Shuttle
- Asphalt Truck
- Block Truck
- Bottom Dump Trailer Combination
- Cementing Vehicle
- City Bus
- Commercial Pick-Up
- Concrete Pumper
- Construction Material Hauler
- Crash Fire Rescue (CFR)
- Mixer
- Demolition
- Drill Rig
- Dump
- Emergency Service
- Equipment Hauling
- Flatbed Trailer Hauler
- Flatbed Truck
- Fracturing Truck
- Front Loader
- Geophysical Exploration
- Hopper Trailer Combinations
- Landscaping Truck
- Liquid Waste Hauler
- Log Hauling
- Lowboy
- Michigan Special Gravel Trains
- Michigan Special Log Hauler
- Michigan Special Steel Hauler
- Michigan Special Waste Vehicle
- Municipal Dump
- Rapid Intervention Vehicle (RIV)
- Rear Loader (Refuse)
- Recycling Truck
- Residential Pick-Up (Refuse)
- Rigging Truck
- Roll-Off
- Scrap Truck
- Semi-End Dump
- Sewer/Septic Vacuum
- Shuttle Bus
- Side Loader
- Snowplow/Snowblower
- Steel Hauling
- Tanker
- Tank Truck
- Tractors with Pole Trailers
- Tractor/Trailer with Jeeps
- Transfer Dump
- Transfer Vehicle
- Transit Bus
- Trolley
- Utility Truck
- Winch Truck

Heavy Service Typically Is

- Moderate mileage operation (less than 60,000 miles per year)
- On/Off road vocations (10% or more off-road)
- Moderate to frequent stops/starts (up to 10 stops per mile)

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Front Drive/Non-Drive Steer Axles – 2/Unl/P&L

FD-965	FH-941	MFS-8-113B-N	MFS-12-132C-N	MFS-13-155	MFS-22H-135A-N	MX-17-140
FF-941	FH-946	MFS-8-153B-N	MFS-12-143A-N	MFS-14-122	MFS-22H-193A-N	MX-19-140
FF-942	FL-941	MFS-8-163B-N	MFS-12-144A-N	MFS-14-143A-N	RF-16-145	MX-21-140
FF-943	FL-943	MFS-10-122A	MFS-12-155	MFS-16-122A-N	RF-21-160	MX-21-160
FF-944	MFS-6-151A-N	MFS-10-143A-N	MFS-13-122	MFS-16-143A-N	MX-10-120	MX-23-160
FF-946	MFS-6-153B	MFS-10-144A-N	MFS-13-122B-N	MFS-18-133A-N	MX-10-120 EVO	MX-810
FF-961	MFS-6-162B	MFS-12-122	MFS-13-122C-N	MFS-18-135A-N	MX-12-120	
FF-966	MFS-6-162C	MFS-12-122B-N	MFS-13-132B-N	MFS-18-193A-N	MX-12-120 EVO	
FF-967	MFS-7-113C-N	MFS-12-122C-N	MFS-13-132C-N	MFS-20-133A-N	MX-14-120	
FG-941	MFS-7-153C-N	MFS-12E-122	MFS-13-143A-N	MFS-20-135A-N	MX-16-120	
FG-943	MFS-7-163C-N	MFS-12-132B-N	MFS-13-144A-N	MFS-20H-193A-N	MX-18-120	

Drivelines

RPL	3/Unl/P, 1/Unl/P&L
92N	1/Unl/P&L
MXL	1/Unl/P&L

Rear Drive Single Axles – 2/Unl/P&L

MS-17-14X	RS-23-160	MS-30-616-SP
RS-17-144/145/A	RC-23-161	RS-30-185/380
MS-19-14X	RS-23-161	MS-35-380
RS-19-144	RS-23-186/380	RS-38-380
MS-21-114	RC-23-162	RC-25-160
MS-21-14X	RC-23-165	RC-26-633
RS-21-145	RS-24-160	MT-58-616
RS-21-145/A	RS-25-160	MT-58-616-SP
RS-21-160	MS-26-616	71162
RC-22-145	MS-26-616-SP	71163
RC-23-160	RS-26-185/380	79163
RH-23-160	MS-30-616	



HEAVY SERVICE WARRANTY INFORMATION

Rear Drive Tandem/Tridem Axles – 2/Unl/P&L

MT-34-14X/P	RT-44-145/P	MT-58-616	RZ-166
RT-34-144/P/A	RT-46-169	MT-58-616-SP	RZ-188
MT-40-14X/P	MT-52-616	RT-58-185/380 ^{1,2}	
RT-40-145/A	MT-52-616-SP	RT-70-380	
MT-44-14X/P	RT-52-185/380 ^{1,2}	MT-70-380	

¹ Axle model designated will vary according to options and variations specified on these axles. Contact Meritor Axle Applications Engineering for details.

² Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.

Brake Components

Cam P	3/Unl/P
Cam P ³	2/100/P
Cam Cast Plus™	2/100/P&L
Q+ Drum Brake™	3/Unl/P&L
Q+ Drum Brake™ ²	2/100/P&L
ASA	3/Unl/P
ASA ²	2/100/P
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P
EX+ Air Disc Brake	2/100/P&L

¹ Based on stamped wear diameter max.

² Applies to City Bus, Trolley, Shuttle Bus and Airport Shuttle only.

³ Warranty for all non-Meritor ASAs supplied by Meritor for all Heavy Service vocations is 1/100/P.

Transfer Cases – 1/Unl/P

MTC-4208	MTC-4213	T-2119
MTC-4210	T-2111	

Rear Drive Tandem – 3/Unl/P&L

RT-40-160/P/A ³
RT-46-160/P/A ^{1,3}
RT-46-164EH/P/A ^{2,3}
RT-50-160/P/A ³

¹ U.S. only. Canadian warranty = 1/Unl/P for combination vehicles only.

² Axle model designated will vary according to options and variations specified on these axles. Contact Meritor Axle Applications Engineering for details.

³ Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.

Meritor Tire Inflation System by PSI

MTIS Components	3/500/P&L
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Trailer Air Suspension Systems

MTA (Trailing Arm)	
Major Structural Components ¹	5/Unl/P, 1/Unl/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs	2/Unl/P, 1/Unl/L
Bushings ¹	5/Unl/P, 3/Unl/L

¹ Raw wood applications 3/Unl/P, 1/Unl/L

(For axle and ABS coverage, refer to appropriate product warranties.)

Center Non-drive Axles – 2/Unl/P&L

MC26000
71063
79063

Trailer Axles

Beam and Brackets ¹	5/Unl/P, 1/Unl/L
Wheel End Systems ²	
Standard System ³	1/Unl/P&L

¹ 9000 Series is 3/Unl/P, 1/Unl/L.

² Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

³ When installed by Meritor.

(For brake components and ABS coverage, refer to appropriate product warranties.)



OFF-HIGHWAY SERVICE WARRANTY INFORMATION

Industrial And Off-Highway Service Vehicles

- | | | | |
|-----------------------|--------------------------|-----------------------|--------------------|
| ■ Load-On/Load-Off | ■ Yard Jockey | ■ Specialized Mining | ■ Rail Car Mover |
| ■ Port Tractor | ■ All-Terrain Crane | ■ Excavator | ■ Loader |
| ■ Rail Yard Spotter | ■ Rough Terrain Crane | ■ Compactor | ■ Tow Tractor |
| ■ Roll-On/Roll-Off | ■ Forestry | ■ Fertilizer Spreader | ■ Pushback Tractor |
| ■ Stevedoring Tractor | ■ Material Handling | ■ Snow Blower | |
| ■ Trailer Spotter | ■ Specialized Heavy Haul | ■ Mining | |

Industrial And Off-Highway Service Typically Is

- Low mileage operation
- Low speed vehicle speed restriction
- Vehicles are **not** typically licensed for highway use
- Six (6) starts/stops per mile (typical)

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Drive Steer Axles – 1/Unl/P

MOR MOX MOC

Front Non-Drive Steer Axles – 1/Unl/P

FF - 941	MFS-12-143A-N	MFS-18-135A-N
FF - 943	MFS-12-144A-N	MFS-18-193A-N
FF - 961	MFS-13-143A-N	MFS-20-133A-N
FF - 966	MFS-13-144A-N	MFS-20-135A-N
FG - 941	MFS-14-143A-N	MFS-20H-193A-N
FG - 943	MFS-16-122A-N	MFS-22H-135A-N
FL - 941	MFS-16-143A-N	MFS-22H-193A-N
FL - 943	MFS-18-133A-N	MON-ZO FAMILY

Planetary Axles – 1/Unl/P

MOR MOX MOC MOT

Rear Drive Single Axles – 1/Unl/P

RS-23-186	RS-24-160-SP	RS-30-185
RS-23-380	MS-30-616	RS-30-380
RS-24-160	MS-30-616-SP	MS-35-380

Drivelines – 1/Unl/P

RPL MXL

Rear Drive Tandem Axles – 2/Unl/P

MT-44-14X/P	MT-58-616	RT-44-145/P	RT-50-160/P
MT-52-616	MT-58-616-SP	RT-46-160/P	RZ-166
MT-52-616-SP	MT-70-380	RT-46-164EH/P	

Brake Components

Cam P	3/Unl/P
Q+ Drum Brake™	3/Unl/P&L
ASA	3/Unl/P
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P



TERMS AND CONDITIONS

Coverage Exclusions

Product Description

All

The cost of any repairs, replacements or adjustments to a covered component (1) associated with noise; (2) resulting from the use or installation of non-genuine Meritor components or materials; (3) due to vibration associated with improper operation or misapplication of drivetrain components; and (4) damage resulting from corrosion.

For axle assemblies supplied by Meritor with suspension and interface brackets designed and/or attached by non-Meritor parties, Meritor warranty coverage does not apply to the brackets, bracket attachment methods, and field issues caused by brackets or bracket attachments to any covered component unless specified in a separate OEM agreement.

Front Axles

King Pin Bushings.

Rear Axles

Self-contained traction equalizers and oil filters. The use of NoSPIN differentials will result in the exclusion of axle shafts from warranty considerations. NoSPIN is a product of Eaton.

ASA

Boot and bushing. Bent, broken, over-torqued, missing or otherwise damaged pawl assemblies.

Cam Brake

Brake lining wear and brake shoe “rust-jacking.”

Disc Brake

Pad wear, rotor wear.

Coverage Limitations

Product Description

All

Any claim beyond 60 days from date of repair will not be accepted or honored under this warranty program. Products purchased on an incomplete vehicle (glider) are limited to one year, unlimited miles parts only (1/Unl/P).

Front Axles

Tie rod and tie rod ends limited to 3-year/300,000-mile or published vocational coverage, whichever is less. Wheel seals, gaskets and wheel bearings are covered for 1 year/unlimited miles if the wheel end equipment is supplied and assembled by Meritor.

Rear Axles

Pinion and through shaft seals limited to 3-year/300,000-mile or published vocational coverage, whichever is less, if yoke is installed by Meritor. If yoke is not installed by Meritor, then Meritor does not warrant pinion seals. Wheel seals, gaskets and wheel bearings are covered for 1 year/unlimited miles if the wheel end equipment is supplied and assembled by Meritor.

Rear Axles

The Meritor® breather part number A-2297-C-8765 with A-3196-J-1336 hose must be used for eligibility of any potential warranty consideration relating to contamination and/or loss of lube in axles.

Cam Brake

Limited to bracket, brake spider and camshaft structural integrity.

STEELite X30

Wearable life is up to the discard diameter of the drum.

Disc Brake

Warranty coverage for boots, seals, bushings and pins is 2/200/P. Warranty coverage for pads is 1/100/P.

Warranty coverage on vehicles with 1,850 lb-ft engine torque and over may be reduced on individual drivetrain components. Contact your Meritor representative for specific details.

TERMS AND CONDITIONS

(1) What is Covered by this Commercial Warranty?

Meritor Inc. warrants to the owner ("Owner") that the components listed in this publication, which have been installed by an Original Equipment Manufacturer ("OEM") as original equipment in vehicles licensed for on-highway use, will be free from defects in material and workmanship. This warranty coverage begins only after the expiration of the OEM's vehicle warranty for the applicable covered components. Warranty coverage ends at the expiration of the applicable time period from the date of vehicle purchase by the first Owner, or, the applicable mileage limitation, whichever occurs first. Duration of coverage varies by component and vocation as detailed elsewhere in this warranty statement.

Some components are warranted for parts only and the Owner must pay any labor costs associated with the repair or replacement of the component. Other components are warranted for both parts and reasonable labor to repair or replace the subject component. Components (whether new, used or remanufactured) installed as replacements under this warranty are warranted only for the remainder of the original period of time or mileage under the original warranty.

For certain components, coverage requires the use of specific extended drain interval or synthetic lubricants. For further information about lubrication and maintenance, see Meritor publication Maintenance Manual Number 1 and the applicable Meritor maintenance manual for the product in question. Other conditions and limitations applicable to this warranty are detailed below.

(2) Designation of Vocational Use Required.

To obtain warranty coverage, each Owner must notify Meritor through the OEM new truck and/or trailer dealer of the intended vocational use of the vehicle into which the Meritor components have been incorporated prior to the vehicle in-service date. This notification may be accomplished by registering the vehicle through your OEM new truck and/or trailer dealer or with Meritor directly. Failure to notify Meritor of (I) the intended vocational use of the vehicle or (II) a change in vocational use from that which was originally designated, will result in the application of a one year, unlimited mileage, parts only warranty (1/Unl/P) from the initial in-service date.

A second Owner and each subsequent Owner must also notify Meritor as to the intended vocational use of the vehicle. This notification can be sent directly to Meritor or through the OEM new truck and/or trailer dealer. The duration and mileage coverage of this warranty cannot exceed the coverage extended to the first Owner after his or her initial designation of vocational use.

Coverage under Meritor's warranty requires that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

(3) What is the Cost of this Warranty?

There is no charge to the Owner for this warranty.

(4) What is not Covered by this Warranty?

This warranty does not cover normal wear and tear; nor does it cover a component that fails, malfunctions or is damaged as a result of (I) improper installation, adjustment, repair or modification (including the use of unauthorized attachments or changes or modification in the vehicle's configuration, usage, or vocation from that which was originally approved by Meritor), (II) accident, natural disaster, abuse, or improper use (including loading beyond the specified maximum vehicle weight or altering engine power settings to exceed the axle and/or driveline capacity), or (III) improper or insufficient maintenance (including deviation from approved lubricants, change intervals, or lube levels). This warranty does not cover any component or part that is not sold by Meritor. For vehicles that operate full or part time outside of the United States and Canada, a one year, unlimited mileage, parts only warranty (1/Unl/P) will apply.

(5) Remedy.

The exclusive remedy under this warranty shall be the repair or replacement of the defective component at Meritor's option. Meritor reserves the right to require that all applicable failed materials are available and/or returned to Meritor for review and evaluation.

(6) Disclaimer of Warranty.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESSED, IMPLIED OR STATUTORY INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

(7) Limitation of Remedies.

In no event shall Meritor be liable for special, incidental, indirect, or consequential damages of any kind or under any legal theory, including, but not limited to, towing, downtime, lost productivity, cargo damage, taxes, or any other losses or costs resulting from a defective covered component.

(8) To Obtain Service.

If the Owner discovers within the applicable coverage period a defect in material or workmanship, the Owner must promptly give notice to either Meritor or the dealer from which the vehicle was purchased. To obtain service, the vehicle must be taken to any participating OEM new truck and/or trailer dealer or authorized Meritor service location. The dealer will inspect the vehicle and contact Meritor for an evaluation of the claim. When authorized by Meritor, the dealer will repair or replace during the term of this warranty any defective Meritor component covered by this warranty.

(9) Entire Agreement.

This is the entire agreement between Meritor and the Owner about warranty and no Meritor employee or dealer is authorized to make any additional warranty on behalf of Meritor. This agreement allocates the responsibilities for component failure between Meritor and the Owner.

Vehicle models, brands and names depicted herein are the property of their respective owners, and are not in any way associated with Meritor, Inc., or its affiliates.



Meritor Heavy Vehicle Systems, LLC
2135 West Maple Road
Troy, Michigan 48084 USA

For more information:
call Ontrac at 866-668-7221
or visit meritor.com

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Fire and Rescue Apparatus

Two (2) Year Material and Workmanship

Meritor Axles

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	The Meritor axle shall be covered by Meritor as indicated in the attached Meritor warranty coverage description
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Two (2) Year
Conditions and Exclusions: See Also Paragraphs 2 thru 4	The exclusions listed in the attached Meritor warranty description shall apply.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY.

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES.

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

MERITOR® COMMERCIAL VEHICLE SYSTEMS

WARRANTY/MODEL YEAR 2018 VEHICLES



MERITOR





WARRANTY INFORMATION CONTENTS

Effective Model Year 2018 Vehicles

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How to Read Warranty Coverage

Number of Years	Mileage (in thousands) Unl=Unlimited	P=Parts Only P&L=Parts & Labor
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Notice:

Models or components that are approved for use by Meritor’s vocational guidelines contained in Meritor Publication TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, which are not specifically listed, are warranted for one year, unlimited miles, parts only (1/Unl/P).

Products purchased on an incomplete vehicle (glider) are limited to one year, unlimited miles parts only (1/Unl/P).

Advantage Program

Purchasing additional coverage on select components will continue to safeguard your investment against major repair costs after the initial base coverage expires. You can find out more about the Advantage Program by visiting www.meritor.com or by contacting Meritor at 866-OnTrac1 (866-668-7221).



LINEHAUL WARRANTY INFORMATION

Linehaul Vehicles

- Auto Hauler
- Bulk Hauler
- Chip Hauler (Truck)*
- Doubles
- Flatbed
- General Freight
- Grain Hauler
- Livestock Hauler
- Moving Van
- Pipe Hauler
- Refrigerated Freight
- Tanker
- Triples

* Chip Hauler vehicles require specific axle models listed below and Linehaul condition to be eligible for Linehaul warranty consideration.

Linehaul Typically Is

- High mileage operation (over 60,000 miles/year)
- Well maintained major highways of concrete or asphalt construction
- Greater than 30 miles between starting and stopping

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Front Non-Drive Steer Axles – 5/750/P&L

FD-965	FF-966	MFS-10-144A-N	MFS-12-132C-N	MFS-13-122C-N	MFS-14-143A-N
FF-941	FF-967	MFS-12-122A-N	MFS-12-143A-N	MFS-13-132B-N	
FF-942	FG-941	MFS-12-122B-N	MFS-12E-143A-N	MFS-13-132C-N	
FF-943	FG-943	MFS-12-122C-N	MFS-12-144A-N	MFS-13-143A-N	
FF-944	MFS-10-122A	MFS-12E-122A-N	MFS-13-122A-N	MFS-13-144A-N	
FF-961	MFS-10-143A-N	MFS-12-132B-N	MFS-13-122B-N	MFS-14-122A-N	

Rear Drive Single Axles – 5/750/P&L

RS-19-144/145/A	RS-21-160
MS-19-14X	RS-23-160
MS-21-144	RS-23-161
RS-21-145	RS-23-186

Rear Drive Tandem/Tridem Axles – 5/750/P&L

RT-34-144/P/A	MA-40-165	MT-40-943
RT-40-145/A	MA-40-175	MT-40-943-SP
RT-40-160/P ^{1,2}	MT-34-14X/P	RZ-166 ²
RT-46-160/P ^{1,2}	MT-40-14X/P	RZ-188
RT-46-164EH/P ^{1,2}	MT-40-14X/P	
RT-50-160/P ^{1,2}	MT-40-144/P	

Drivelines

RPL	5/500/P, 1/Unl/P&L
MXL	3/350/P, 1/Unl/P&L
155N	1/Unl/P
92N	1/Unl/P

¹ These models required for Chip Hauler and Linehaul warranty consideration.
² Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.



LINEHAUL WARRANTY INFORMATION

Brake Components

Cam Q Series Trailer Brakes	5/500/P, 1/100/L
LX500 Feature ¹	5/750/P&L
Q+ Drum Brake™	5/500/P, 1/Unl/P&L
ASA	5/500/P, 1/Unl/P&L
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P
STEELite X30 Drum Brake™ ²	12-Years or Wearable Life/P
EX+ Air Disc Brake™	5/500/P, 1/Unl/L

¹ Includes: bushing, seal, cam, ASA lubrication and wear coverage of 3/500/P&L.

² Based on stamped wear diameter max.

Trailer Axles

Beam and Brackets	5/500/P, 1/100/L
Wheel End Systems ¹	
Standard System ²	1/100/P&L
PreSet by Meritor ³	5/500/P&L
AxlePak ⁴	5P/L
AxlePak ⁵	7P/L

¹ Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

² When installed by Meritor.

³ Requires approved hubcap stating PreSet by Meritor on hubcap face.

⁴ When specified with AxlePak5 wheel end system, coverage on MTIS thru-tee and stator is 5/500P, 3/500L.

⁵ When specified with AxlePak7 wheel end system, coverage on MTIS thru-tee and stator is 7/750P, 3/500L.

(For brake components and ABS coverage, refer to appropriate product warranties.)

TAG/Pusher Axles¹

TQ, TQD, TR, TRD Beam and Brackets	5/750/P&L
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¹ For brake components and ABS Coverage, refer to appropriate product warranties.

Meritor Tire Inflation System by PSI

MTIS Components	3/500/P&L
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Trailer Air Suspension Systems

MPA38/40 (Tandem Axle Parallelogram) ¹	
Major Structural Components	5/500/P, 1/100/L
Curbing Damage Warranty ²	5/500/P, 1/100/L
Height Control Valve	1/100/P&L
Shock Absorbers	2/200/P&L
Air Springs	2/200/P, 1/100/L
Bushings	7/700/P, 5/500/L
PinLoc Air Controls	1/100/P&L
PinLoc Actuator	3/300/P&L
MPA20 (Single Axle Parallelogram)	
Major Structural Components	5/500/P, 1/100/L
Height Control Valve	1/100/P&L
Shock Absorbers	2/200/P&L
Air Springs	2/200/P, 1/100/L
Bushings	7/700/P, 5/500/L
MTA (Trailing Arm)	
Major Structural Components	5/500/P, 1/100/L
Height Control Valve	1/100/P&L
Shock Absorbers	2/200/P&L
Air Springs & Rebound Straps	2/200/P, 1/100/L
Bushings	5/500/P, 3/300/L

¹ Fastener torque coverage is limited to 2/Unl P&L when torqued by Meritor (For axle and ABS coverage, refer to appropriate product warranties.)

² “Curbing damage” is defined as deformation (bending, buckling, or breakage), caused by sudden impact with a curb or similar fixed object. Damage to the RideSentry slider box (the suspension sliding subframe, consisting of the frame rails, crossmembers, and central A-frame assembly), caused by accidental trailer impact with a curb or similar fixed object, is eligible for warranty coverage. Damage to other components or damage resulting from collision with another vehicle, rollover or fire is not covered under this provision. Warranty is not transferrable to another trailer VIN, and coverage does not apply if the trailer is deemed to be a total loss, scrapped, or otherwise not salvageable.



GENERAL SERVICE WARRANTY INFORMATION

General Service Vehicles

- Aerial Ladder Truck
- Aerial Platform
- Ambulance
- Auto Hauler
- Beverage Truck
- Chip Hauler
- Cross Country Coach
- Flatbed
- Front Engine Commercial Chassis
- Front Engine Integral Coach
- General Freight
- Intercity Coach
- Intermodal Chassis
- Livestock Hauler
- Meat Packer
- Moving Van
- Municipal Truck
- Newspaper Delivery
- Pick-Up and Delivery
- Pipe Hauler
- Platform Auto Hauler
- Pumper
- Rear Engine Integral Coach
- Recreational Vehicles
- Refrigerated Freight
- School Bus
- Stake Truck
- Tanker
- Tanker Truck
- Tour Bus
- Wrecker

General Service Typically Is

- Lower mileage operations (less than 60,000 miles/year)
- Generally, on-road service (less than 10% off-road)
- An average of three (3) miles between starting and stopping

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Front Drive/Non-Drive Steer Axles – 2/Uni/P&L

FD-965	FH-941	MFS-7-153C-N	MFS-12E-122A-N	MFS-13-122C-N	MFS-18-135A-N
FF-941	FH-946 ¹	MFS-7-163C-N	MFS-12-122B-N	MFS-13-132B-N	MFS-18-193A-N
FF-942	FL-941	MFS-8-113B-N	MFS-12-122C-N	MFS-13-132C-N	MFS-20-133A-N
FF-943	FL-943	MFS-8-143A-N	MFS-12-132B-N	MFS-13-143A-N	MFS-20-135A-N
FF-944	MFS-6-151A-N	MFS-8-153B-N	MFS-12-132C-N	MFS-13-144A-N	MFS-20H-193A-N
FF-946	MFS-6-153B-N	MFS-8-163B-N	MFS-12-143A-N	MFS-14-122A-N	MFS-22H-135A-N
FF-961	MFS-6-162B-N	MFS-10-122A	MFS-12-144A-N	MFS-14-143A-N	MFS-22H-193A-N
FF-966	MFS-6-153C-N	MFS-10-143A-N	MFS-12E-143A-N	MFS-16-122A-N	
FF-967	MFS-6-162C-N	MFS-10-144A-N	MFS-13-122A-N	MFS-16-143A-N	
FG-941	MFS-7-113C-N	MFS-12-122A-N	MFS-13-122B-N	MFS-18-133A-N	

¹ Can also be used with reduced steer angles in tag position in Coach Applications.

Rear Drive Single Axles – 2/Uni/P&L

MS-17-13X	MS-21-144	RC-23-162 ¹	MS-26-616	79163
MS-17-14X	MS-23-17X	RC-23-165 ¹	MS-26-616-SP	
MS-19-13X	RS-21-145/A	RS-23-160	RS-30-185	
MS-19-14X	RS-21-160	RS-23-161	MS-30-616	
RS-17-144/145/A	RC-22-145	RS-23-186	MS-30-616-SP	
RS-19-144/145/A	RC-22-145/A	RS-24-160	RS-35-380	
MS-21-13X	RC-23-160	RC-25-160	71162	
MS-21-14X	RC-23-161	RS-26-185	71163	

¹ 3/Uni/P&L if PreSet by Meritor.

Rear Drive Tandem – 3/Uni/P&L

RT-40-160/P	RT-46-164EH/P
RT-46-160/P	RT-50-160/P

Drivelines

RPL	4/400/P, 1/Uni/P&L
MXL	3/350/P, 1/Uni/P&L
155N	1/Uni/P
92N	1/Uni/P

Rear Drive Tandem/Tridem Axles – 2/Uni/P&L

MT-34-14X/P	MT-44-14X/P	MT-58-616
RT-34-144/P/A	RT-44-145/P	RT-58-185 ¹
MT-40-14X/P	RT-46-169	MT-70-380
MT-40-144/P	MT-52-616	RZ-166
RT-40-145/A	RT-52-185 ¹	RZ-188

¹ Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.



GENERAL SERVICE WARRANTY INFORMATION

Brake Components

Cam Q Series Trailer Brakes	3/Unl/P, 1/Unl/L
LX500 Feature ¹	3/Unl/P&L
Cam P ³	2/200/P
Cam	3/Unl/P
Q+ Drum Brake™	3/Unl/P&L
Q+ Drum Brake™ ³	2/200/P&L
ASA	3/Unl/P
ASA ³	2/200/P
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P
STEELite X30 Drum Brake™ ²	12-Years or Wearable Life/P
EX+ Air Disc Brake™	2/Unl/P&L

¹ Includes: bushing, seal, cam, ASA lubrication and wear coverage of 1/Unl/P.

² Based on stamped wear diameter max.

³ Applies to Tour Bus and Cross Country Coach only.

Trailer Axles

Beam and Brackets ¹	5/Unl/P, 1/Unl/L
Wheel End Systems ²	
Standard System ³	1/Unl/P&L
AxlePak ⁴	5P/L
AxlePak ⁵	7P/L

¹ 9000 Series is 3/Unl/P, 1/Unl/L

² Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

³ When installed by Meritor.

⁴ When specified with AxlePak5 wheel end system, coverage on MTIS thru-tee and stator is 5/500P, 3/500L.

⁵ When specified with AxlePak7 wheel end system, coverage on MTIS thru-tee and stator is 7/750P, 3/500L.

(For brake components and ABS coverage, refer to appropriate product warranties.)

Chassis Axles (2000 Series/ChassiPak)

Beam & Brackets	6/Unl/P, 1/Unl/L
Wheel End Systems ¹	
Standard System	1/Unl/P&L
AxlePak7	7P/L
Beam and Brackets	7P/1L

¹ Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

Trailer Air Suspension Systems

MPA38/40 (Tandem Axle Parallelogram) ¹	
Major Structural Components	5/Unl/P, 1/Unl/L
Curbing Damage Warranty ²	5/500/P, 1/100/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs	2/Unl/P, 1/Unl/L
Bushings	7/700/P, 5/500/L
PinLoc Air Controls	1/Unl/P&L
PinLoc Air Actuator	3/Unl/P&L
MPA20 (Single Axle Parallelogram)	
Major Structural Components	5/Unl/P, 1/Unl/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs	2/Unl/P, 1/Unl/L
Bushings	7/700/P, 5/500/L
MTA (Trailing Arm)	
Major Structural Components	5/Unl/P, 1/Unl/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs and Rebound Straps	2/Unl/P, 1/Unl/L
Bushings ³	5/Unl/P, 3/Unl/L

(For axle and ABS coverage, refer to appropriate product warranties.)

¹ Fastener torque coverage is limited to 2/Unl P&L when torqued by Meritor

² "Curbing damage" is defined as deformation (bending, buckling, or breakage), caused by sudden impact with a curb or similar fixed object. Damage to the RideSentry slider box (the suspension sliding subframe, consisting of the frame rails, crossmembers, and central A-frame assembly), caused by accidental trailer impact with a curb or similar fixed object, is eligible for warranty coverage. Damage to other components or damage resulting from collision with another vehicle, rollover or fire is not covered under this provision. Warranty is not transferrable to another trailer VIN, and coverage does not apply if the trailer is deemed to be a total loss, scrapped, or otherwise not salvageable.

³ Raw wood applications 3/Unl/P, 1/Unl/L

TAG/Pusher Axles

TQ, TQD, TR, TRD Beam and Brackets ¹	3/Unl/P, 1/Unl/L
MC12002, MC14002, MC16003, FH946	2/Unl/P&L

(For brake components and ABS coverage, refer to appropriate product warranties.)

¹ 3/UNL/P&L if sold with PreSet by Meritor.

Meritor® Tire Inflation System by PSI

MTIS Components	3/500/P&L
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HEAVY SERVICE WARRANTY INFORMATION

Heavy Service Vehicles

- Airport Rescue Fire (ARF)
- Airport Shuttle
- Asphalt Truck
- Block Truck
- Bottom Dump Trailer Combination
- Cementing Vehicle
- City Bus
- Commercial Pick-Up
- Concrete Pumper
- Construction Material Hauler
- Crash Fire Rescue (CFR)
- Mixer
- Demolition
- Drill Rig
- Dump
- Emergency Service
- Equipment Hauling
- Flatbed Trailer Hauler
- Flatbed Truck
- Fracturing Truck
- Front Loader
- Geophysical Exploration
- Hopper Trailer Combinations
- Landscaping Truck
- Liquid Waste Hauler
- Log Hauling
- Lowboy
- Michigan Special Gravel Trains
- Michigan Special Log Hauler
- Michigan Special Steel Hauler
- Michigan Special Waste Vehicle
- Municipal Dump
- Rapid Intervention Vehicle (RIV)
- Rear Loader (Refuse)
- Recycling Truck
- Residential Pick-Up (Refuse)
- Rigging Truck
- Roll-Off
- Scrap Truck
- Semi-End Dump
- Sewer/Septic Vacuum
- Shuttle Bus
- Side Loader
- Snowplow/Snowblower
- Steel Hauling
- Tanker
- Tank Truck
- Tractors with Pole Trailers
- Tractor/Trailer with Jeeps
- Transfer Dump
- Transfer Vehicle
- Transit Bus
- Trolley
- Utility Truck
- Winch Truck

Heavy Service Typically Is

- Moderate mileage operation (less than 60,000 miles per year)
- On/Off road vocations (10% or more off-road)
- Moderate to frequent stops/starts (up to 10 stops per mile)

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Front Drive/Non-Drive Steer Axles – 2/Unl/P&L

FD-965	FH-941	MFS-8-113B-N	MFS-12-132C-N	MFS-13-155	MFS-22H-135A-N	MX-17-140
FF-941	FH-946	MFS-8-153B-N	MFS-12-143A-N	MFS-14-122	MFS-22H-193A-N	MX-19-140
FF-942	FL-941	MFS-8-163B-N	MFS-12-144A-N	MFS-14-143A-N	RF-16-145	MX-21-140
FF-943	FL-943	MFS-10-122A	MFS-12-155	MFS-16-122A-N	RF-21-160	MX-21-160
FF-944	MFS-6-151A-N	MFS-10-143A-N	MFS-13-122	MFS-16-143A-N	MX-10-120	MX-23-160
FF-946	MFS-6-153B	MFS-10-144A-N	MFS-13-122B-N	MFS-18-133A-N	MX-10-120 EVO	MX-810
FF-961	MFS-6-162B	MFS-12-122	MFS-13-122C-N	MFS-18-135A-N	MX-12-120	
FF-966	MFS-6-162C	MFS-12-122B-N	MFS-13-132B-N	MFS-18-193A-N	MX-12-120 EVO	
FF-967	MFS-7-113C-N	MFS-12-122C-N	MFS-13-132C-N	MFS-20-133A-N	MX-14-120	
FG-941	MFS-7-153C-N	MFS-12E-122	MFS-13-143A-N	MFS-20-135A-N	MX-16-120	
FG-943	MFS-7-163C-N	MFS-12-132B-N	MFS-13-144A-N	MFS-20H-193A-N	MX-18-120	

Drivelines

RPL	3/Unl/P, 1/Unl/P&L
92N	1/Unl/P&L
MXL	1/Unl/P&L

Rear Drive Single Axles – 2/Unl/P&L

MS-17-14X	RS-23-160	MS-30-616-SP
RS-17-144/145/A	RC-23-161	RS-30-185/380
MS-19-14X	RS-23-161	MS-35-380
RS-19-144	RS-23-186/380	RS-38-380
MS-21-114	RC-23-162	RC-25-160
MS-21-14X	RC-23-165	RC-26-633
RS-21-145	RS-24-160	MT-58-616
RS-21-145/A	RS-25-160	MT-58-616-SP
RS-21-160	MS-26-616	71162
RC-22-145	MS-26-616-SP	71163
RC-23-160	RS-26-185/380	79163
RH-23-160	MS-30-616	



HEAVY SERVICE WARRANTY INFORMATION

Rear Drive Tandem/Tridem Axles – 2/Unl/P&L

MT-34-14X/P	RT-44-145/P	MT-58-616	RZ-166
RT-34-144/P/A	RT-46-169	MT-58-616-SP	RZ-188
MT-40-14X/P	MT-52-616	RT-58-185/380 ^{1,2}	
RT-40-145/A	MT-52-616-SP	RT-70-380	
MT-44-14X/P	RT-52-185/380 ^{1,2}	MT-70-380	

¹ Axle model designated will vary according to options and variations specified on these axles. Contact Meritor Axle Applications Engineering for details.

² Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.

Brake Components

Cam P	3/Unl/P
Cam P ³	2/100/P
Cam Cast Plus™	2/100/P&L
Q+ Drum Brake™	3/Unl/P&L
Q+ Drum Brake™ ²	2/100/P&L
ASA	3/Unl/P
ASA ²	2/100/P
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P
EX+ Air Disc Brake	2/100/P&L

¹ Based on stamped wear diameter max.

² Applies to City Bus, Trolley, Shuttle Bus and Airport Shuttle only.

³ Warranty for all non-Meritor ASAs supplied by Meritor for all Heavy Service vocations is 1/100/P.

Transfer Cases – 1/Unl/P

MTC-4208	MTC-4213	T-2119
MTC-4210	T-2111	

Rear Drive Tandem – 3/Unl/P&L

RT-40-160/P/A ³
RT-46-160/P/A ^{1,3}
RT-46-164EH/P/A ^{2,3}
RT-50-160/P/A ³

¹ U.S. only. Canadian warranty = 1/Unl/P for combination vehicles only.

² Axle model designated will vary according to options and variations specified on these axles. Contact Meritor Axle Applications Engineering for details.

³ Each vehicle must have a Request for Application Recommendation (RAR) approved by Meritor prior to vehicle build. All RARs must identify the chassis number or VIN. Refer to Product Information Letter #303 and #396 for further details.

Meritor Tire Inflation System by PSI

MTIS Components	3/500/P&L
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Trailer Air Suspension Systems

MTA (Trailing Arm)	
Major Structural Components ¹	5/Unl/P, 1/Unl/L
Height Control Valve	1/Unl/P&L
Shock Absorbers	2/Unl/P&L
Air Springs	2/Unl/P, 1/Unl/L
Bushings ¹	5/Unl/P, 3/Unl/L

¹ Raw wood applications 3/Unl/P, 1/Unl/L

(For axle and ABS coverage, refer to appropriate product warranties.)

Center Non-drive Axles – 2/Unl/P&L

MC26000
71063
79063

Trailer Axles

Beam and Brackets ¹	5/Unl/P, 1/Unl/L
Wheel End Systems ²	
Standard System ³	1/Unl/P&L

¹ 9000 Series is 3/Unl/P, 1/Unl/L.

² Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

³ When installed by Meritor.

(For brake components and ABS coverage, refer to appropriate product warranties.)



OFF-HIGHWAY SERVICE WARRANTY INFORMATION

Industrial And Off-Highway Service Vehicles

- | | | | |
|-----------------------|--------------------------|-----------------------|--------------------|
| ■ Load-On/Load-Off | ■ Yard Jockey | ■ Specialized Mining | ■ Rail Car Mover |
| ■ Port Tractor | ■ All-Terrain Crane | ■ Excavator | ■ Loader |
| ■ Rail Yard Spotter | ■ Rough Terrain Crane | ■ Compactor | ■ Tow Tractor |
| ■ Roll-On/Roll-Off | ■ Forestry | ■ Fertilizer Spreader | ■ Pushback Tractor |
| ■ Stevedoring Tractor | ■ Material Handling | ■ Snow Blower | |
| ■ Trailer Spotter | ■ Specialized Heavy Haul | ■ Mining | |

Industrial And Off-Highway Service Typically Is

- Low mileage operation
- Low speed vehicle speed restriction
- Vehicles are **not** typically licensed for highway use
- Six (6) starts/stops per mile (typical)

Coverage under Meritor's warranty require that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

Drive Steer Axles – 1/Unl/P

MOR MOX MOC

Front Non-Drive Steer Axles – 1/Unl/P

FF - 941	MFS-12-143A-N	MFS-18-135A-N
FF - 943	MFS-12-144A-N	MFS-18-193A-N
FF - 961	MFS-13-143A-N	MFS-20-133A-N
FF - 966	MFS-13-144A-N	MFS-20-135A-N
FG - 941	MFS-14-143A-N	MFS-20H-193A-N
FG - 943	MFS-16-122A-N	MFS-22H-135A-N
FL - 941	MFS-16-143A-N	MFS-22H-193A-N
FL - 943	MFS-18-133A-N	MON-ZO FAMILY

Planetary Axles – 1/Unl/P

MOR MOX MOC MOT

Rear Drive Single Axles – 1/Unl/P

RS-23-186	RS-24-160-SP	RS-30-185
RS-23-380	MS-30-616	RS-30-380
RS-24-160	MS-30-616-SP	MS-35-380

Drivelines – 1/Unl/P

RPL MXL

Rear Drive Tandem Axles – 2/Unl/P

MT-44-14X/P	MT-58-616	RT-44-145/P	RT-50-160/P
MT-52-616	MT-58-616-SP	RT-46-160/P	RZ-166
MT-52-616-SP	MT-70-380	RT-46-164EH/P	

Brake Components

Cam P	3/Unl/P
Q+ Drum Brake™	3/Unl/P&L
ASA	3/Unl/P
Hubs/Cast Drums and Other Wheel-end Components	1/Unl/P
Hydraulic Disc Brakes	1/Unl/P
All Other Brakes	1/Unl/P



TERMS AND CONDITIONS

Coverage Exclusions

Product Description

All

The cost of any repairs, replacements or adjustments to a covered component (1) associated with noise; (2) resulting from the use or installation of non-genuine Meritor components or materials; (3) due to vibration associated with improper operation or misapplication of drivetrain components; and (4) damage resulting from corrosion.

For axle assemblies supplied by Meritor with suspension and interface brackets designed and/or attached by non-Meritor parties, Meritor warranty coverage does not apply to the brackets, bracket attachment methods, and field issues caused by brackets or bracket attachments to any covered component unless specified in a separate OEM agreement.

Front Axles

King Pin Bushings.

Rear Axles

Self-contained traction equalizers and oil filters. The use of NoSPIN differentials will result in the exclusion of axle shafts from warranty considerations. NoSPIN is a product of Eaton.

ASA

Boot and bushing. Bent, broken, over-torqued, missing or otherwise damaged pawl assemblies.

Cam Brake

Brake lining wear and brake shoe “rust-jacking.”

Disc Brake

Pad wear, rotor wear.

Coverage Limitations

Product Description

All

Any claim beyond 60 days from date of repair will not be accepted or honored under this warranty program. Products purchased on an incomplete vehicle (glider) are limited to one year, unlimited miles parts only (1/Unl/P).

Front Axles

Tie rod and tie rod ends limited to 3-year/300,000-mile or published vocational coverage, whichever is less. Wheel seals, gaskets and wheel bearings are covered for 1 year/unlimited miles if the wheel end equipment is supplied and assembled by Meritor.

Rear Axles

Pinion and through shaft seals limited to 3-year/300,000-mile or published vocational coverage, whichever is less, if yoke is installed by Meritor. If yoke is not installed by Meritor, then Meritor does not warrant pinion seals. Wheel seals, gaskets and wheel bearings are covered for 1 year/unlimited miles if the wheel end equipment is supplied and assembled by Meritor.

Rear Axles

The Meritor® breather part number A-2297-C-8765 with A-3196-J-1336 hose must be used for eligibility of any potential warranty consideration relating to contamination and/or loss of lube in axles.

Cam Brake

Limited to bracket, brake spider and camshaft structural integrity.

STEELite X30

Wearable life is up to the discard diameter of the drum.

Disc Brake

Warranty coverage for boots, seals, bushings and pins is 2/200/P. Warranty coverage for pads is 1/100/P.

Warranty coverage on vehicles with 1,850 lb-ft engine torque and over may be reduced on individual drivetrain components. Contact your Meritor representative for specific details.

TERMS AND CONDITIONS

(1) What is Covered by this Commercial Warranty?

Meritor Inc. warrants to the owner ("Owner") that the components listed in this publication, which have been installed by an Original Equipment Manufacturer ("OEM") as original equipment in vehicles licensed for on-highway use, will be free from defects in material and workmanship. This warranty coverage begins only after the expiration of the OEM's vehicle warranty for the applicable covered components. Warranty coverage ends at the expiration of the applicable time period from the date of vehicle purchase by the first Owner, or, the applicable mileage limitation, whichever occurs first. Duration of coverage varies by component and vocation as detailed elsewhere in this warranty statement.

Some components are warranted for parts only and the Owner must pay any labor costs associated with the repair or replacement of the component. Other components are warranted for both parts and reasonable labor to repair or replace the subject component. Components (whether new, used or remanufactured) installed as replacements under this warranty are warranted only for the remainder of the original period of time or mileage under the original warranty.

For certain components, coverage requires the use of specific extended drain interval or synthetic lubricants. For further information about lubrication and maintenance, see Meritor publication Maintenance Manual Number 1 and the applicable Meritor maintenance manual for the product in question. Other conditions and limitations applicable to this warranty are detailed below.

(2) Designation of Vocational Use Required.

To obtain warranty coverage, each Owner must notify Meritor through the OEM new truck and/or trailer dealer of the intended vocational use of the vehicle into which the Meritor components have been incorporated prior to the vehicle in-service date. This notification may be accomplished by registering the vehicle through your OEM new truck and/or trailer dealer or with Meritor directly. Failure to notify Meritor of (I) the intended vocational use of the vehicle or (II) a change in vocational use from that which was originally designated, will result in the application of a one year, unlimited mileage, parts only warranty (1/Unl/P) from the initial in-service date.

A second Owner and each subsequent Owner must also notify Meritor as to the intended vocational use of the vehicle. This notification can be sent directly to Meritor or through the OEM new truck and/or trailer dealer. The duration and mileage coverage of this warranty cannot exceed the coverage extended to the first Owner after his or her initial designation of vocational use.

Coverage under Meritor's warranty requires that the application of products be properly approved pursuant to OEM and Meritor approvals. Refer to TP-9441 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific application approval questions on any product line.

(3) What is the Cost of this Warranty?

There is no charge to the Owner for this warranty.

(4) What is not Covered by this Warranty?

This warranty does not cover normal wear and tear; nor does it cover a component that fails, malfunctions or is damaged as a result of (I) improper installation, adjustment, repair or modification (including the use of unauthorized attachments or changes or modification in the vehicle's configuration, usage, or vocation from that which was originally approved by Meritor), (II) accident, natural disaster, abuse, or improper use (including loading beyond the specified maximum vehicle weight or altering engine power settings to exceed the axle and/or driveline capacity), or (III) improper or insufficient maintenance (including deviation from approved lubricants, change intervals, or lube levels). This warranty does not cover any component or part that is not sold by Meritor. For vehicles that operate full or part time outside of the United States and Canada, a one year, unlimited mileage, parts only warranty (1/Unl/P) will apply.

(5) Remedy.

The exclusive remedy under this warranty shall be the repair or replacement of the defective component at Meritor's option. Meritor reserves the right to require that all applicable failed materials are available and/or returned to Meritor for review and evaluation.

(6) Disclaimer of Warranty.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESSED, IMPLIED OR STATUTORY INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

(7) Limitation of Remedies.

In no event shall Meritor be liable for special, incidental, indirect, or consequential damages of any kind or under any legal theory, including, but not limited to, towing, downtime, lost productivity, cargo damage, taxes, or any other losses or costs resulting from a defective covered component.

(8) To Obtain Service.

If the Owner discovers within the applicable coverage period a defect in material or workmanship, the Owner must promptly give notice to either Meritor or the dealer from which the vehicle was purchased. To obtain service, the vehicle must be taken to any participating OEM new truck and/or trailer dealer or authorized Meritor service location. The dealer will inspect the vehicle and contact Meritor for an evaluation of the claim. When authorized by Meritor, the dealer will repair or replace during the term of this warranty any defective Meritor component covered by this warranty.

(9) Entire Agreement.

This is the entire agreement between Meritor and the Owner about warranty and no Meritor employee or dealer is authorized to make any additional warranty on behalf of Meritor. This agreement allocates the responsibilities for component failure between Meritor and the Owner.

Vehicle models, brands and names depicted herein are the property of their respective owners, and are not in any way associated with Meritor, Inc., or its affiliates.



Meritor Heavy Vehicle Systems, LLC
2135 West Maple Road
Troy, Michigan 48084 USA

For more information:
call Ontrac at 866-668-7221
or visit meritor.com

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Fire and Rescue Apparatus

Three (3) Year Material and Workmanship Meritor Wabco ABS Brake System Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	The Meritor Wabco ABS brake system shall be covered by Meritor Wabco as indicated in the attached Meritor Wabco warranty coverage description
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Three (3) Year
Conditions and Exclusions: See Also Paragraphs 2 thru 4	The exclusions listed in the attached Meritor Wabco warranty description shall apply.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY.

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES.

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.



MERITOR WABCO

Safety Strong. Efficiency Smart.

Warranty
Model Year 2018 Vehicles

SIMPLER IS BETTER

Warranty coverage is essential to protecting your investment. But understanding the full details of your coverage can be challenging. This straightforward approach allows you, our valued customer, to better understand how your specific vehicle applications will be covered in your region. Our component warranty coverage is provided according to vocation/usage categories listed below.

- Linehaul covers high mileage operation (over 60,000 miles/year) on well maintained major highways of concrete or asphalt construction.
- General Service covers moderate mileage operations (less than 60,000 miles/year) on well maintained public roads (less than 10 percent off-road) typically with less than three (3) stops per mile.
- Heavy Service (Vocational) covers vehicles with more than 10 percent off-road OR moderate to frequent starts/stops typically with more than three (3) stops per mile.
- Off-Highway Service covers lower mileage operations. Vehicles are not typically licensed for highway use.

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- Linehaul Service..... 4
- General Service..... 4
- Heavy Service 5
- Industrial/Off-Highway Service 6
- Terms and Conditions 7

How to Read Warranty Coverage (Example)

Number of Years	Mileage (in thousands) Unl=Unlimited	P=Parts Only P&L=Parts & Labor
3	300	P

HEAVY SERVICE (VOCATIONAL) WARRANTY INFORMATION

Heavy Service Vehicles

- Airport Rescue Fire (ARF)
- Airport Shuttle
- Asphalt Truck
- Block Truck
- Bottom Dump Trailer Combination
- Cementing Vehicle
- City Bus
- Commercial Pick-Up
- Concrete Pumper
- Construction Material Hauler
- Crash Fire Rescue (CFR)
- Mixer
- Demolition
- Drill Rig
- Dump
- Emergency Service
- Equipment Hauling
- Flatbed Trailer Hauler
- Flatbed Truck
- Fracturing Truck
- Front Loader
- Geophysical Exploration
- Hopper Trailer Combinations
- Landscaping Truck
- Liquid Waste Hauler
- Log Hauling
- Lowboy
- Michigan Special Gravel Trains
- Michigan Special Log Hauler
- Michigan Special Steel Hauler
- Michigan Special Waste Vehicle
- Municipal Dump
- Newspaper Delivery
- Package Delivery
- Pick-up and Delivery
- Rapid Intervention Vehicle (RIV)
- Rear Loader
- Recycling Truck
- Residential Pick-Up/Waste
- Rigging Truck
- Roll-Off
- Scrap Truck
- Semi-End Dump
- Sewer/Septic Vacuum
- Shuttle Bus
- Side Loader
- Snowplow/Snowblower
- Steel Hauling
- Tanker
- Tank Truck
- Tractors with Pole Trailers
- Tractor/Trailer with Jeeps
- Transfer Dump
- Transfer Vehicle
- Transit Bus
- Trolley
- Utility Truck
- Winch Truck

Heavy Service Typically Is

- On/Off road vocations (10% or more off-road) OR
- Moderate to frequent starts/stops typically more than three (3) stops per mile

Meritor WABCO Components¹

ABS (Anti-Lock Braking System) Air	3/300/P&L
ABS (Anti-Lock Braking System) Hydraulic	2/200/P&L
Electronic Braking System (EBS)	3/300/P&L
Electronic Stability Control (ESC)	3/300/P&L
Roll Stability Control (RSC)	3/300/P&L
Air Dryers (ALL)	1/100/P&L
Leveling Valves	1/100/P&L
Air Brake Valves	1/100/P&L
Emission Valves (SCR)	2/200/P&L
Clutch Controls	2/200/P&L
Air Compressors (ALL) ²	1/100/P&L
OnGuard™	3/300/P&L
OnGuardACTIVE™	3/300/P&L
OnLane™ Lane Departure Warning	3/300/P&L
Blind Spot Detection	3/300/P&L
OptiRide™	2/200/P&L
Trailer Roll Stability Support (RSS)	3/300/P&L
Trailer Control Line Filter ³	1/100/P&L
Trailer ABS Valve ³	3/300/P&L

¹ WABCO and Meritor WABCO branded components.

² WABCO compressors installed on Cummins, Mercedes, and DDC engines are not warranted or serviced by Meritor WABCO. Please contact your respective dealer/distributor of those engines for warranty and servicing.

³ An extended warranty of 4/400/P will be applied when a Meritor WABCO Trailer Control Line Filter is used in combination with a Meritor WABCO Trailer ABS valve.



TERMS AND CONDITIONS

Coverage Exclusions

Product Description

All

The cost of any repairs, replacements or adjustments to a covered product due to the following: (1) damage to the product or its component parts caused by incorrect use, installation, maintenance or repair, including without limitation (a) improper fit of mating components or brackets, (b) damaged threads, (c) cut, broken, chafed, pinched or otherwise damaged wiring (sensors, harnesses and connectors), (d) damaged sensors from removal when seized in block, or associated with sensor adjustments/alignments, and (e) damage resulting from the use or installation of non-genuine Meritor WABCO components or materials; (2) damage to the product, its component parts, or diminished product or component part performance due to incorrect operation, deviation from approved conditions or misapplication; (3) any unauthorized disassembly of the product or its component parts including without limitation (a) obliterated, defaced or missing WABCO or Meritor WABCO name plate, serial numbers or label identifying the device as a Meritor WABCO product or WABCO component, (b) changes to sealed adjusting screws, and (c) opening or attempted repair of non-serviceable components; (4) malfunction of the component due to internal contamination out of the vehicle system including without limitation (a) water and other contamination damage that is due to the use of a non-genuine air dryer cartridge or (b) valve failures due to contamination in air system, (5) complaints associated with noise, (6) damage resulting from corrosion (including oxidation of electrical devices and connections).

Air Dryers

Mounting brackets (see vehicle OEM). Desiccant cartridge housing only.

Air System Components

Normal wear items; Gladhand seals, dash valve knobs, valve actuation handles, treadles, pedals.

ABS, Electronic Stability Control (ESC), Roll Stability Control (RSC), OptiRide™, OnGuard™ and OnLane™, collectively “Electronics”

Failure of electronic components due to overvoltage condition, improper grounding, electrostatic discharge (ESD), improper shielding, electromagnetic interference (EMI), or other wiring or installation issues.

Malfunctions and failure codes caused by other electronic subsystem failures (data bus, engine, transmission, dashboard, etc.)

Hydraulic Components

For certain components, brake fluid DOT3 or DOT4 is used as the operating medium. Use of any other fluid will void all warranties associated with that component. For hydraulic braking applications the brake fluid is considered a maintenance item. Maintenance intervals are listed in TB-1367.

Coverage Limitations

Product Description

All

Any claim beyond 60 days from date of repair will not be accepted or honored under this warranty program.

Products purchased on an incomplete vehicle (glider) are limited to one year, 1/Unl/P.

For vehicles that operate full- or part-time outside of the United States and Canada, a 1-Year/Unlimited Miles parts only (1/Unl/P) will apply.

TOOLBOX™ Software

Proper diagnostics of Meritor WABCO Electronics may require the latest version of TOOLBOX™. Additional labor due to use of an outdated version of TOOLBOX™. TOOLBOX™ software, and/or the time to purchase or install latest version of TOOLBOX™ are not covered under product warranty.

TERMS AND CONDITIONS

(1) What is Covered by this Commercial Warranty?

Meritor WABCO Vehicle Control Systems warrants to the owner ("Owner") that the components listed in this publication, which have been installed by an Original Equipment Manufacturer ("OEM") as original equipment will be free from defects in material and workmanship. This warranty coverage begins from the original in-service date to the limits provided and runs concurrently with any warranties provided by OEMs and/or any service contracts that cover the components listed in this publication, if any. If the components listed in this publication are covered by an OEM warranty and/or service contract, then the OEM's warranty and/or service contract shall supersede Meritor WABCO's warranty and Owner shall comply with all OEM's warranty and/or service contract requirements for claims under such OEM's warranty and/or service contract until those agreements expire. Once those agreements expire and provided the Meritor WABCO warranty has not expired under the terms stated above, the Meritor WABCO warranty would be in effect until its expiration date.

Warranty coverage ends at the expiration of the applicable time period from the date of vehicle purchase by the first Owner, or, the applicable mileage limitation, whichever occurs first. Duration of coverage varies by component and vocation as detailed previously in this publication. Some components are warranted for parts only and the Owner must pay any labor costs associated with the repair or replacement of the component. Other components are warranted for both parts and reasonable labor to repair or replace the subject component. Additional diagnostic time due to use of an outdated version of TOOLBOX™, time to purchase or install latest version of TOOLBOX™ are the responsibility of the authorized Meritor WABCO service location and are not covered under product warranty. Components installed as replacements under this warranty are warranted only for the remainder of the original period of time or mileage under the original warranty.

(2) Designation of Vocational Use Required.

To obtain warranty coverage, each Owner must notify Meritor WABCO through the OEM new truck and/or trailer dealer of the intended vocational use of the vehicle into which the Meritor WABCO components have been incorporated prior to the vehicle in-service date. This notification may be accomplished by registering the vehicle through your OEM new truck and/or trailer dealer or with Meritor WABCO directly. Failure to notify Meritor WABCO of (I) the intended vocational use of the vehicle or (II) a change in vocational use from that which was originally designated, will result in the application of a one year, unlimited mileage, parts only warranty (1/Unl/P) from the initial in-service date.

A second Owner and each subsequent Owner must also notify Meritor WABCO as to the intended vocational use of the vehicle. This notification can be sent directly to Meritor WABCO or through the OEM new truck and/or trailer dealer. The duration and mileage coverage of this warranty cannot exceed the coverage extended to the first Owner after his or her initial designation of vocational use.

Coverage under Meritor WABCO's warranty requires that the application of products be properly approved pursuant to OEM and Meritor WABCO, approvals.

(3) What is the Cost of this Warranty?

There is no charge to the Owner for this warranty.

(4) What is not Covered by this Warranty?

In addition to the items listed on page 7, this warranty does not cover normal wear and tear, or service items; nor does it cover a component that fails, malfunctions or is damaged as a result of

(a) improper handling, storage, installation, adjustment, repair or modification including the use of unauthorized attachments or changes or modification in the vehicle's configuration, usage, or vocation from that which was originally approved by Meritor WABCO, (b) accident, fire or other casualty, natural disaster, road debris, negligence, misuse, abuse, or improper use (including loading beyond the specified maximum vehicle weight or altering engine power settings to exceed the brake system capacity), or (c) improper or insufficient maintenance (including deviation from maintenance intervals, approved lubricants, or lube levels). This warranty does not cover any component or part that is not sold by Meritor WABCO.

(5) Remedy.

The exclusive remedy under this warranty shall be the repair or replacement of the defective component at Meritor WABCO's option. Meritor WABCO reserves the right to require that all applicable covered components are available and/or returned to Meritor WABCO for review and evaluation.

(6) DISCLAIMER OF WARRANTY.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS, IMPLIED OR STATUTORY INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. SOME STATES LIMIT OR DO NOT ALLOW THE DISCLAIMER OF IMPLIED OR OTHER WARRANTIES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO THE EXTENT SUCH STATE'S LAW IS APPLICABLE TO THESE TERMS.

(7) LIMITATION OF REMEDIES.

IN NO EVENT SHALL MERITOR WABCO BE LIABLE FOR SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES OF ANY KIND OR UNDER ANY LEGAL THEORY, INCLUDING, BUT NOT LIMITED TO, TOWING, DOWNTIME, LOST PRODUCTIVITY, CARGO DAMAGE, TAXES, LOST PROFITS, COSTS OF PROCUREMENT OF A SUBSTITUTE COMPONENT OR ANY OTHER LOSSES OR COSTS RESULTING FROM A COVERED COMPONENT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO THE EXTENT SUCH STATE'S LAW IS APPLICABLE TO THESE TERMS.

(8) TIME LIMIT ON COMMENCING LEGAL ACTION.

ANY LEGAL ACTION OR CLAIM ARISING FROM OR RELATED TO THIS WARRANTY, IN CONTRACT OR OTHERWISE, MUST BE COMMENCED WITHIN ONE YEAR FROM THE ACCRUAL OF THAT CAUSE OF ACTION, OR BE BARRED FOREVER.

(9) To Obtain Service.

If the Owner discovers within the applicable coverage period a defect in material or workmanship, the Owner must promptly give notice to either Meritor WABCO or the dealer from which the vehicle was purchased. To obtain service, the vehicle must be taken to any participating OEM new truck and/or trailer dealer or authorized Meritor WABCO service location. The dealer will inspect the vehicle and contact Meritor WABCO for an evaluation of the claim. When authorized by Meritor WABCO, the dealer will repair or replace during the term of this warranty any defective Meritor WABCO component covered by this warranty.

(10) Entire Agreement.

This is the entire agreement between Meritor WABCO and the Owner about warranty and no Meritor, Meritor WABCO employee, or dealer is authorized to make any additional warranty on behalf of Meritor WABCO unless in writing and signed by an authorized representative of Meritor WABCO.

For more information on
Meritor WABCO Warranty, call
our OnTrac Customer Service team
at 866-OnTrac1 (866-668-7221)
or visit meritorwabco.com.



Fire and Rescue Apparatus

Ten (10) Year Structural Integrity

Custom Cab

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	The Pierce Custom Cab shall be free from structural failures caused by defects in material and workmanship
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Ten (10) Years - or - 100,000 Miles
Conditions and Exclusions: See Also Paragraphs 2 thru 4	This warranty applies only to the cab tubular support and mounting structures and other structural components of the cab of the vehicle model, as identified in the Pierce specifications for the Fire and Rescue Apparatus. This warranty does not apply to damage caused by corrosion.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Fire and Rescue Apparatus

Ten (10) Year Pro-Rated Paint and Corrosion

Cab

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Exterior surfaces of the cab painted by Pierce shall be free from blistering, peeling, corrosion or any other adhesion defect caused by defective manufacturing methods or paint material selection.
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Ten (10) Years
Conditions and Exclusions: See Also Paragraphs 2 thru 4	<p>This limited warranty is applicable to the vehicle in the following percentage costs of warranty repair, if any:</p> <p>Topcoat Durability & Appearance: Gloss, Color Retention & Cracking 0-72 months 100% 73-96 months 50% 97-120 months 25%</p> <p>Integrity of Coating System: Adhesion, Blistering/Bubbling 0-36 months 100% 37-84 months 50% 85-120 months 25%</p> <p>Corrosion: Dissimilar Metal and Crevice 0-36 months 100% 37-48 months 50% 49-72 months 25% 73-120 months 10%</p> <p>Corrosion Perforation 0-120 months 100%</p> <p>This limited warranty applies only to exterior paint. Paint on the vehicle's interior is warranted only under the Pierce Basic One Year Limited Warranty.</p> <p>Items not covered by this warranty include: (a) Damage from lack of maintenance and cleaning (proper cleaning and maintenance procedures are detailed in the Pierce operation and maintenance manual). (b) UV paint fade. (c) Any cab not manufactured by Pierce.</p>

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Fire and Rescue Apparatus

Five (5) Year Material and Workmanship

Command Zone Electronics

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Command Zone control modules shall be free from failures caused by defects in material and workmanship
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Five (5) Years
Conditions and Exclusions: See Also Paragraphs 2 thru 4	This limited warranty applies to all of the control modules for the Command Zone system, including the full color graphic displays. Related wire harnesses, cables and connectors are not covered under this limited warranty and are instead covered under the Pierce One Year Basic Apparatus Limited Warranty.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Fire and Rescue Apparatus

Ten (10) Year Material and Workmanship

Pierce 12V LED Strip Light

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	This limited warranty covers repairs to correct any defect related to materials or workmanship of the Pierce 12V LED strip lights installed on the apparatus occurring during the warranty period.
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Ten (10) Year
Conditions and Exclusions: See Also Paragraphs 2 thru 4	This limited warranty does not apply to related wire harnesses, cables, and connectors, which are covered by the Pierce one (1) year basic apparatus limited warranty.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY.

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES.

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.

NEW PRODUCT WARRANTY



**PARTICIPATING OEM SALES
DISTRIBUTOR SALES**

LIMITED WARRANTY ON NEW ALLISON AUTOMATIC TRANSMISSIONS USED IN EMERGENCY VEHICLE APPLICATIONS

Allison Transmission will provide for repairs or replacement, at its option, during the warranty period of each new Allison transmission listed below that is installed in an Emergency Vehicle in accordance with the following terms, conditions, and limitations.

WHAT IS COVERED

- **WARRANTY APPLIES** — This warranty is for new Allison transmission models listed below installed in an Emergency Vehicle and is provided to the original and any subsequent owner(s) of the vehicle during the warranty period.
- **REPAIRS COVERED** — The warranty covers repairs or replacement, at Allison Transmission’s option, to correct any transmission malfunction resulting from defects in material or workmanship occurring during the warranty period. Needed repairs or replacements will be performed using the method Allison Transmission determines most appropriate under the circumstances.
- **TOWING** — Towing is covered to the nearest Allison Transmission Distributor or authorized Dealer only when necessary to prevent further damage to your transmission.
- **PAYMENT TERMS** — Warranty repairs, including parts and labor, will be covered per the schedule shown in the chart contained in section “APPLICABLE MODELS, WARRANTY LIMITATIONS, AND ADJUSTMENT SCHEDULE.”
- **OBTAINING REPAIRS** — To obtain warranty repairs, take the vehicle to any Allison Transmission Distributor or authorized Dealer within a reasonable amount of time and request the needed repairs. A reasonable amount of time must be allowed for the Distributor or Dealer to perform necessary repairs.
- **TRANSMISSION REMOVAL AND REINSTALLATION** — Labor costs for the removal and re-installation of the transmission, when necessary to make a warranty repair, are covered by this warranty.
- **WARRANTY PERIOD** — The warranty period for all coverages shall begin on the date the transmission is delivered to the first retail purchaser, with the following exception:

Demonstration Service - A transmission in a new truck or bus may be demonstrated to a total of 5000 miles (8000 kilometers). If the vehicle is within this limit when sold to a retail purchaser, the warranty start date is the date of purchase. Normal warranty services are applicable to the demonstrating Dealer. Should the truck or bus be sold to a retail purchaser after these limits are reached, the warranty period will begin on the date the vehicle was first placed in demonstration service and the purchaser will be entitled to the remaining warranty.

APPLICABLE MODELS, WARRANTY LIMITATIONS, AND ADJUSTMENT SCHEDULE

APPLICABLE MODELS	WARRANTY LIMITATIONS (Whichever occurs first)		ADJUSTMENT CHARGE TO BE PAID BY THE CUSTOMER	
	Months	Transmission Miles Or Kilometers	Parts	Labor
MT, MD 3000, 3200, 3500, 3700	0-24	No Limit	No Charge	No Charge
HT with Hydraulic Controls	0-24	No Limit	No Charge	No Charge
AT, 1000 Series™, 2000 Series™, 2400 Series™	0-36	No Limit	No Charge	No Charge
HT with Electronic Controls	0-60	No Limit	No Charge	No Charge
HD 1000 EVS, 2100 EVS, 2200 EVS 2350 EVS, 2500 EVS, 2550 EVS, 3000 EVS, 3500 EVS, 4000, 4000 EVS, 4500, 4500 EVS, 4700, 4700 EVS, 4800, 4800 EVS	0-60	No Limit	No Charge	No Charge

WHAT IS NOT COVERED

- **DAMAGE DUE TO ACCIDENT, MISUSE, or ALTERATION** — Defects and damage caused as the result of any of the following are not covered:
 - Flood, collision, fire, theft, freezing, vandalism, riot, explosion, or objects striking the vehicle;
 - Misuse of the vehicle;
 - Installation into unapproved applications and installations;
 - Alterations or modification of the transmission or the vehicle, and
 - Damage resulting from improper storage (refer to long-term storage procedure outlined in the applicable Allison Service Manual)
 - Anything other than defects in Allison Transmission material or workmanship

NOTE: This warranty is void on transmissions used in vehicles currently or previously titled as salvaged, scrapped, junked, or totaled.

- **CHASSIS, BODY, and COMPONENTS** — The chassis and body company (assemblers) and other component and equipment manufacturers are solely responsible for warranties on the chassis, body, component(s), and equipment they provide. Any transmission repair caused by an alteration(s) made to the Allison transmission or the vehicle which allows the transmission to be installed or operated outside of the limits defined in the appropriate Allison Installation Guideline is solely the responsibility of the entity making the alteration(s).
- **DAMAGE CAUSED by LACK of MAINTENANCE or by the USE of TRANSMISSION FLUIDS NOT RECOMMENDED in the OPERATOR'S MANUAL** — Defects and damage caused by any of the following are not covered:
 - Failure to follow the recommendations of the maintenance schedule intervals applicable to the transmission;
 - Failure to use transmission fluids or maintain transmission fluid levels recommended in the Operator's Manual.
- **MAINTENANCE** — Normal maintenance (such as replacement of filters, screens, and transmission fluid) is not covered and is the owner's responsibility.
- **REPAIRS by UNAUTHORIZED DEALERS** — Defects and damage caused by a service outlet that is not an authorized Allison Transmission Distributor or Dealer are not covered.
- **USE of OTHER THAN GENUINE ALLISON TRANSMISSION PARTS** — Defects and damage caused by the use of parts that are not genuine Allison Transmission parts are not covered.
- **EXTRA EXPENSES** — Economic loss and extra expenses are not covered. Examples include but are not limited to: loss of vehicle use; inconvenience; storage; payment for loss of time or pay; vehicle rental expense; lodging; meals; or other travel costs.
- **"DENIED PARTY" OWNERSHIP** — Warranty repair parts and labor costs are not reimbursed to any participating or non-participating OEMs, dealers or distributors who perform warranty work for, or on behalf of, end users identified by the United States as being a "denied party" or who are citizens of sanctioned or embargoed countries as defined by the U.S. Department of Treasury Office of Foreign Assets Control. Furthermore, warranty reimbursements are not guaranteed if the reimbursement would be contrary to any United States export control laws or regulations as defined by the U.S. Department of Commerce, the U.S. Department of State, or the U.S. Department of Treasury.

OTHER TERMS APPLICABLE TO CONSUMERS AS DEFINED by the MAGNUSON-MOSS WARRANTY ACT

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Allison Transmission does not authorize any person to create for it any other obligation or liability in connection with these transmissions.

ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE APPLICABLE TO THESE TRANSMISSIONS IS LIMITED IN DURATION TO THE DURATION OF THIS WRITTEN WARRANTY. PERFORMANCE OF REPAIRS AND NEEDED ADJUSTMENTS IS THE EXCLUSIVE REMEDY UNDER THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY. ALLISON TRANSMISSION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (SUCH AS, BUT NOT LIMITED TO, LOST WAGES OR VEHICLE RENTAL EXPENSES) RESULTING FROM BREACH OF THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY.**

** Some states do not allow limitations on how long an implied warranty will last or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

OTHER TERMS APPLICABLE TO OTHER END-USERS

THIS WARRANTY IS THE ONLY WARRANTY APPLICABLE TO THE ALLISON TRANSMISSION MODELS LISTED ABOVE AND IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ALLISON TRANSMISSION DOES NOT AUTHORIZE ANY PERSON TO CREATE FOR IT ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION WITH SUCH TRANSMISSIONS. ALLISON TRANSMISSION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM BREACH OF THIS WARRANTY OR ANY IMPLIED WARRANTY.

QUESTIONS

If you have any questions regarding this warranty or the performance of warranty obligations, you may contact any Allison Transmission Distributor or Dealer or write to:

Allison Transmission, Inc.
P.O. Box 894
Indianapolis, IN 46206-0894
Attention: Warranty Administration PF-9



Fire and Rescue Apparatus

Five (5) Year Material and Workmanship - Transmission Oil Cooler Three (3) Year Collateral Damage Coverage

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	The transmission cooler shall be free from component or structural failures caused by defects in material and/or workmanship. Collateral damage up to \$10,000 per occurrence is available for the first three (3) years.
Warranty Begins:	The date of delivery to the first retail purchaser.
Warranty Period Ends After:	Five (5) Years on Oil Cooler and three (3) years on collateral damage coverage
Conditions and Exclusions: See Also Paragraphs 2 thru 4	<p>This warranty does not cover repair due to accidents, misuse, and excessive vibration, flying debris, storage damage (freezing), negligence or modification. This warranty is void if any modification or repairs are performed without authorization. This also voids any future warranty.</p> <p>This warranty does not cover cost of maintenance or repairs due to lack of required maintenance services as recommended. Performance of the required maintenance and use of proper fluids are the responsibility of the owner.</p> <p>Towing is covered to the nearest distributor or authorized dealer only when necessary to prevent further damage to your transmission.</p> <p>Labor costs for the removal and reinstallation of goods may be covered when necessary to make repairs. Please contact your OEM for authorization.</p> <p>Replacement of cooler during the warranty period is limited to 100% of reasonable labor costs up to a maximum of \$700 to remove, replace, or repair the oil cooler.</p>

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Fire and Rescue Apparatus

Ten (10) Year Structural Integrity Apparatus Body

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	The apparatus body shall be free from structural failures caused by defects in material and workmanship
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Ten (10) Years - or - 100,000 Miles
Conditions and Exclusions: See Also Paragraphs 2 thru 4	This warranty applies only to the body tubular support and mounting structures and other structural components of the body of the vehicle model, as identified in the Pierce specifications for the Fire and Rescue Apparatus. This warranty does not apply to damage caused by corrosion.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Fire and Rescue Apparatus

Twenty (20) Year Structural Integrity Pierce Aerial Device

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Each new Pierce Aerial Device shall be free from defects in material and workmanship. Aerial Device Models Covered by this warranty include: Aerial Platforms Aerial Ladders SkyBoom
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Twenty (20) Years - or - 100,000 Miles
Conditions and Exclusions: See Also Paragraphs 2 thru 4	This warranty applies only to the torque box, turntable, aerial sections and other structural components of the aerial device, as identified in the Pierce specifications for the aerial device. This warranty shall be void if, or to the extent that the aerial device is not maintained in strict compliance with NFPA Standard 1911 in effect at time of sale, including such periodic inspections and testing by qualified third parties as are required by that Standard as it may be in effect from time to time. Proof of such compliance shall accompany any claims under this warranty. Third party testing agencies known to Pierce to be qualified for such purposes may be obtained from the Pierce Customer Service Department This warranty does not apply to damage caused by corrosion.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY.

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES.

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



AMITY FIRE AND SAFETY, INC.

3750 CHESTNUT ROAD
ALBURTIS, PA 18011-0451
Phone: 610-966-3115
Fax: 610-965-6313

* STANDARD FIVE YEAR WARRANTY *

(standard warranty is in effect for parts shipped after 4/15/10)

Three Function Swivel

A. PRESHIPMENT TESTING The Three Function Swivel fabricated by Amity which is exposed to pressure during normal use is subject to final inspection using the following pressure minimums:

1. Hydrostatic applications will be tested to 400 PSI unless specified otherwise on approved drawings. Operating pressures on installed systems are not to exceed 250 PSI at any point in the system. Warranty will be voided and Amity will not be held liable for failure and/or damage occurring from Water Hammering or freezing of water in any system.
2. Hydraulic applications will be tested to 4000 PSI. System operating pressure in application to be 3000 PSI maximum.
3. Dielectric and Continuity Test all circuits. 30 Amp max current loading.

B. THREE FUNCTION SWIVEL MAINTENANCE – Our Three Function Swivel has been fully tested at assembly. Under no circumstances is there to be any maintenance performed internally or externally to the Three Function Swivel by Purchaser or any other third party other than an authorized representative of or Amity itself. The Three Function Swivel is sealed and must remain so. The Three Function Swivel is designed for a long maintenance free life. Should any problems occur or replacement be necessary, first contact Amity. There is to be no field maintenance performed on the Three Function Swivel .

C. MOUNTING REQUIREMENTS – The following are the mounting requirements for the Three Function Swivel:

1. Mounting points and methods are to be determined at the initial design stage. All drawings and applicable documentation must be signed off by both parties and filed for future reference. No deviation to the approved mounting is allowed without approval from Amity.
2. The Three Function Swivel is to be mounted concentric to the center of the turntable bearing.
3. All inlet and outlet plumbing to conform to swivel mounting, under no circumstances is the Three Function Swivel to be positioned to match connections. This will avoid putting excessive loads on the Three Function Swivel. All tubing or piping to be supported by means other than the Three Function Swivel.

D. LIMITED WARRANTY, LIMITATIONS, CONDITIONS AND PROCEDURES REQUIRED.

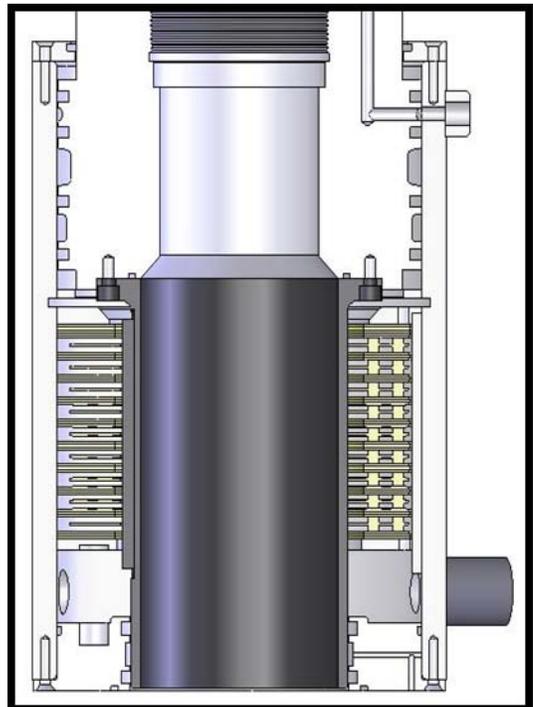
1. The Three Function Swivel is warranted to be free of defects in labor and/or materials for a period of five (5) years from the Date of Service. For purposes here, "Date of Service" shall mean the date when the Three Function Swivel, or the unit to which the Three Function Swivel is incorporated, passes final Underwriters Laboratory testing, or similarly compliant testing, and is certified for service. Evidence of such Date of Service shall be required in connection with any warranty claim by Purchaser.
2. The Three Function Swivel shall be repaired or replaced at the sole option and expense of the Amity provided the Three Function Swivel alleged to be defective was used for its intended normal use of operation and subject to the following qualifications and limitations.
3. Any alteration of the Three Function Swivel without consent from Amity is strictly forbidden and shall void warranty.
4. No welding shall be performed on finished Three Function Swivel.
5. No responsibility is assumed for any malfunctions or damages which are occasionally caused by foreign objects which may be ingested into water or hydraulic systems such as, but not limited to stones, sand or metal chips.
6. Amity assumes responsibility for our Three Function Swivel, which is defective only, and therefore, it will not assume responsibility for labor to either remove or install our Three Function Swivel unless it agrees in writing to assume such responsibility.
7. Unless otherwise approved in writing by the Amity all returns of defective Three Function Swivels (or allegedly defective Three Function Swivels) are at Purchaser's expense and must include a RGA number issued by the Amity.

8. All warranty claims must be presented at the time the problem occurs, or as soon as practical thereafter, either called or faxed to the Amity and include the numbers on the assembly's Amity's label with a detailed explanation of the difficulty in order for the matter to be appropriately evaluated and resolved.
9. Amity will not be held liable for damage incurred during shipment.
10. No responsibility shall be assumed for misuse or improper mounting, unreasonably use or abuse of the Three Function Swivel and or failure to provide or use improper maintenance, failure to follow written installation and use in instruction or any use other than the customary designed use.

THE REMEDIES PROVIDED IN THE ABOVE EXPRESS LIMITED WARRANTY AND ARE THE SOLE AND EXCLUSIVE REMEDIES AVAILABLE. NO OTHER EXPRESS WARRANTIES ARE MADE. ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE ARE LIMITED IN DURATION AS SET FORTH ABOVE. IN NO EVENT SHALL THE AMITY ASSUME OR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

THE WITHIN DESCRIBED WARRANTY SHALL ONLY BE AFFORDED TO THE ORIGINAL PURCHASER OR FOR INCORPORATION INTO ANOTHER UNIT AND TO FIRST PURCHASER AS PART OF COMPLETED UNIT, HOWEVER, THE WARRANTY PERIOD OF FIVE YEARS IS FROM THE DATE OF SERVICE WITH THE UNDERSTANDING IT IS INSTALLED WITHIN A REASONABLE TIME PERIOD.

Dated: _____, 20__





Fire and Rescue Apparatus

Five (5) Year Material and Workmanship Aerial Hydraulic System Components

Three (3) Year Material and Workmanship Aerial Hydraulic System Seals

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	The aerial hydraulic system components and seals shall be free from component or structural failures caused by defects in material and/or workmanship.
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Five (5) Years and Three (3) Years
Conditions and Exclusions: See Also Paragraphs 2 thru 4	Pierce's obligation under this warranty is limited to repairing or replacing without charge, as Pierce may elect, the hydraulic lines, fittings, valves, seals, cylinders, filters, pumps, hydraulic motors, rotary actuators, or components which Pierce determines to have failed due to defective material and workmanship. This warranty shall not apply unless the aerial device is inspected in accordance with NFPA 1911 Standard for Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus and the applicable Pierce Operator and Maintenance Manuals.

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



AMITY FIRE AND SAFETY, INC.

3750 CHESTNUT ROAD
ALBURTIS, PA 18011-0451
Phone: 610-966-3115
Fax: 610-965-6313

* STANDARD TEN YEAR WARRANTY *

(standard warranty is in effect for parts shipped after 4/15/10)

Telescopic Waterways

A. PRESHIPMENT TESTING All waterways fabricated by Amity are final inspected using the following pressure minimums:

1. Hydrostatic applications will be tested to 400 PSI unless specified otherwise on approved drawings. Operating pressures on installed systems are not to exceed 250 PSI at any point in the system. Warranty will be voided and Amity will not be held liable for failure and/or damage occurring from Water Hammering or freezing of water in any system.

B. COMPONENTS DESCRIPTION AND MAINTENANCE

1. All components are thoroughly greased at assembly. Since internally lubricated seals are used, regular greasing is not required. We recommend components not be greased at installation.
2. Slip Tube Assemblies may be greased at the Amity's regularly scheduled Aerial Inspections. The seals in the Slip Tube Assemblies are self-lubricating, so greasing is not mandatory. We do recommend a visual inspection of the Slip Tube Assembly while it is fully extended after initial installation, from that point on we recommend inspection every ten hours of aerial operation. If any deposits of aluminum appear, they are to be rubbed off using a Teflon scouring pad. Slip Tube Assemblies are designed to give long maintenance free service; however, like any product, problems may occur and periodic visual inspections will aid in determining if a potential problem exists and warrants a call to us. Care must be taken to keep debris off of extended tubes. We recommend wiping tubes with light oil (10 weight) or hydraulic oil after use, if tubes appear to have contamination on them. Under no circumstance are tubes to be cleaned with lacquer thinner, or any other solvent.

C. LIMITED WARRANTY, LIMITATIONS, CONDITIONS AND PROCEDURES REQUIRED.

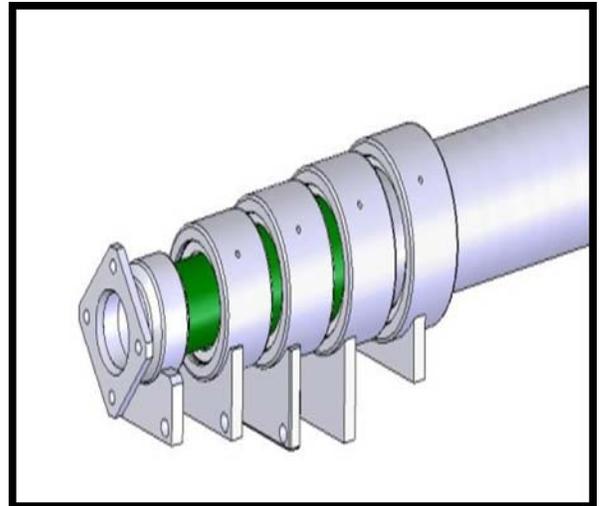
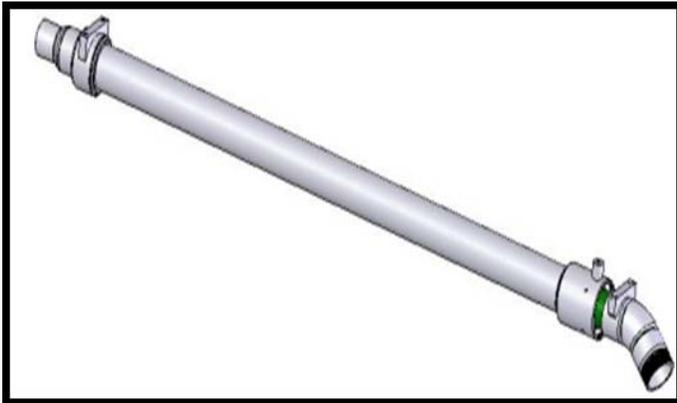
1. Products are warranted to be free of defects in labor and/or materials for a period of ten years from the date of purchase from the Amity and shall be repaired or replaced at the sole option and expense of the Amity provided the products alleged to be defective was used for its intended normal use operation and subject to the following qualifications and limitations.
2. Any alteration of product without consent from Amity is strictly forbidden and shall void warranty.
3. No welding shall be performed on finished product.
4. No responsibility is assumed for any malfunctions or damages which are occasionally caused by foreign objects which may be ingested into water system such as, but not limited to stones, sand or metal chips.
5. Amity assumes responsibility for our product, which is defective only, and therefore, it will not assume responsibility for labor to either remove or install our product unless it agrees in writing to assume such responsibility.
6. Unless otherwise approved in writing by the Amity all returns of defective (or allegedly defective products) are at Purchaser's expense and must include a RGA number issued by the Amity.
7. All warranty claims must be presented at the time the problem occurs, or as soon as practical thereafter, either called or faxed to the Amity and include the numbers on the assembly's Amity's label with a detailed explanation of the difficulty in order for the matter to be appropriately evaluated and resolved.
8. Amity will not be held liable for damage incurred during shipment.
9. No responsibility shall be assumed for misuse or improper mounting, unreasonably use or abuse of the Product and or failure to provide or use improper maintenance, failure to follow written installation and use in instruction or any use other than the customary designed use.

THE REMEDIES PROVIDED IN THE ABOVE EXPRESS LIMITED WARRANTY AND ARE THE SOLE AND EXCLUSIVE REMEDIES AVAILABLE. NO OTHER EXPRESS WARRANTIES ARE MADE. ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR

FITNESS FOR A PARTICULAR PURPOSE OR USE ARE LIMITED IN DURATION AS SET FORTH ABOVE. IN NO EVENT SHALL THE AMITY ASSUME OR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

THE WITHIN DESCRIBED WARRANTY SHALL ONLY BE AFFORDED TO THE ORIGINAL PURCHASER OR FOR INCORPORATION INTO ANOTHER UNIT AND TO FIRST PURCHASER AS PART OF COMPLETED UNIT, HOWEVER, THE WARRANTY PERIOD OF TEN YEARS COMMENCES UPON INSTALLATION INTO FINAL ASSEMBLY WITH THE UNDERSTANDING IT IS INSTALLED WITHIN SIX MONTHS OF PURCHASE.

Dated: _____, 20__





Fire and Rescue Apparatus

Four (4) Year Pro-Rated Paint and Corrosion

Aerial Device

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Aerial device shall be free from blistering, peeling, corrosion or any other adhesion defect caused by defective manufacturing methods or paint material selection for exterior surfaces.
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Four (4) Years
Conditions and Exclusions:	<p>This limited warranty is applicable to the vehicle in the following percentage costs of warranty repair, if any:</p> <p>Topcoat Durability & Appearance: Gloss, Color Retention & Cracking 0-24 months 100% 25-48 months 50%</p> <p>Integrity of Coating System: Adhesion, Blistering/Bubbling 0-24 months 100% 25-48 months 50%</p> <p>Corrosion: Dissimilar Metal and Crevice 0-24 months 100% 25-48 months 50%</p> <p>Corrosion Perforation 0-24 months 100% 25-48 months 50%</p> <p>This limited warranty applies only to exterior paint.</p> <p>Items not covered by this warranty include: (a) Damage from lack of maintenance and cleaning (proper cleaning and maintenance procedures are detailed in the Pierce operation and maintenance manual). (b) UV paint fade.</p>

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Limited Warranty

Commercial Mobile Generating Sets

This limited warranty applies to all Cummins Onan® branded Commercial Mobile CMHG SERIES Hydraulic and PROTEC AC SERIES generating sets and associated accessories (hereinafter referred to as "Product").

This warranty covers any failures of the Product, under normal use and service, which result from a defect in material or factory workmanship.

Warranty Period:

The warranty start date is the date of sale of Product to the first retail purchaser by Cummins Power Generation®. The coverage duration is 5 years from warranty start date or 1,000 hours, whichever occurs first.

Cummins Power Generation® Responsibilities:

In the event of a failure of the Product during the warranty period due to defects in material or workmanship, Cummins Power Generation® will only be responsible for the following costs:

Years 1 & 2

- All parts and labor required to repair the Product.
- Maintenance items that are contaminated or damaged by a warrantable failure.
- Travel time up to 2.5 hours and mileage up to 100 miles for warranty related repairs.

Years 3-5

- All parts and labor required to repair the Product.

Owner Responsibilities:

The owner will be responsible for the following:

- Providing evidence of the date of sale to the first retail purchaser.
- Notifying Cummins Power Generation® distributor or dealer within 30 days of the discovery of failure.
- Installing, operating, commissioning and maintaining the Product in accordance with Cummins Power Generation®'s published policies and guidelines.
- Providing sufficient access to and reasonable ability to remove the Product from the installation in the event of a warrantable failure.

In addition, the owner will be responsible for:

- Incremental costs and expenses associated with Product removal and reinstallation resulting from non-standard installations.
- Costs associated with rental of generator sets used to replace the Product being repaired.
- Costs associated with labor overtime and premium shipping requested by the owner.
- All downtime expenses, fines, all applicable taxes, and other losses resulting from a warrantable failure.

Limitations:

This limited warranty does not cover Product failures resulting from:

- Inappropriate use relative to designated power rating.
- Inappropriate use relative to application guidelines.
- Normal wear, corrosion and varnished fuel system parts
- Owner's or operator's negligence, accidents or misuse.
- Lack of maintenance or improper repair.
- Noncompliance with any Cummins Power Generation® published guideline or policy.

- Use of improper or contaminated fuels, coolants or lubricants. Owner's delay in making Product available after notification of potential Product problem.
- Replacement parts and accessories not authorized by Cummins Power Generation®.

Limitations Continued:

- Operation without adequate coolant or lubricants.
- Lack of maintenance to lubricating, cooling or air intake systems.
- Late servicing and maintenance.
- Improper storage, starting, warm-up, run-in or shutdown practices.
- Damage to parts, fixtures, housings, attachments and accessory items that are not part of the generator set.

This limited warranty does not cover costs resulting from:

- Difficulty in gaining access to the Product.
- Damage to customer property.
- Repair of cosmetic damage to enclosures.

www.cumminsonan.com

CUMMINS POWER GENERATION® RIGHT TO FAILED COMPONENTS:

Failed components claimed under warranty remain the property of Cummins Power Generation®. Cummins Power Generation® has the right to reclaim any failed component that has been replaced under warranty.

THIS IS THE SOLE WARRANTY MADE BY CUMMINS POWER GENERATION ® IN REGARD TO THE PRODUCT. CUMMINS POWER GENERATION® MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT IS CUMMINS POWER GENERATION® LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This limited warranty shall be enforced to the maximum extent permitted by applicable law. This limited warranty gives the owner specific rights that may vary from state to state or from jurisdiction to jurisdiction.

Product Model Number: _____

Product Serial Number: _____

Date in Service: _____



Fire and Rescue Apparatus

Ten (10) Year Pro-Rated Paint and Corrosion

Custom Body

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Exterior surfaces of the body shall be free from blistering, peeling, corrosion or any other adhesion defect caused by defective manufacturing methods or paint material selection.
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Ten (10) Years
Conditions and Exclusions: See Also Paragraphs 2 thru 4	<p>This limited warranty is applicable to the vehicle in the following percentage costs of warranty repair, if any:</p> <p>Topcoat Durability & Appearance: Gloss, Color Retention & Cracking 0-72 months 100% 73-96 months 50% 97-120 months 25%</p> <p>Integrity of Coating System: Adhesion, Blistering/Bubbling 0-36 months 100% 37-84 months 50% 85-120 months 25%</p> <p>Corrosion: Dissimilar Metal and Crevice 0-36 months 100% 37-48 months 50% 49-72 months 25% 73-120 months 10%</p> <p>Corrosion Perforation 0-120 months 100%</p> <p>This limited warranty applies only to exterior paint. Paint on the vehicle's interior is warranted only under the Pierce Basic One Year Limited Warranty.</p> <p>Items not covered by this warranty include: (a) Damage from lack of maintenance and cleaning (proper cleaning and maintenance procedures are detailed in the Pierce operation and maintenance manual). (b) UV paint fade. (c) Any cab not manufactured by Pierce.</p>

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

THE WARRANTY SET FORTH IN PARAGRAPH 1 IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIERCE. PIERCE HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE.

3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Fire and Rescue Apparatus

Three (3) Year Material and Workmanship

Goldstar® Gold Leaf Lamination

Limited Warranty

1. LIMITED WARRANTY

Subject to the limitations and exclusions set forth below, Pierce Manufacturing provides the following warranty to the Buyer:

Coverage:	Each Goldstar® gold leaf lamination shall be free from defects in material and workmanship.
Warranty Begins:	The date of the original purchase invoice (issued when the product ships from the factory).
Warranty Period Ends After:	Three (3) Years
Conditions and Exclusions: See Also Paragraphs 2 thru 4	This warranty does not cover damage from lack of maintenance and cleaning (proper cleaning and maintenance procedures are detailed in the Pierce operation and maintenance manual).

This limited warranty shall apply only if the product is properly maintained in accordance with Pierce's maintenance instructions and manuals and is used in service which is normal to the particular model. Normal service means service which does not subject the product to stresses or impacts greater than normally result from careful use. If the Buyer discovers a defect or nonconformity, it must notify Pierce in writing within thirty (30) days after the date of discovery, but in any event prior to the expiration of the warranty period. THIS LIMITED WARRANTY MAY NOT BE ASSIGNED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

Notwithstanding anything to the contrary herein, Pierce makes no warranty whatsoever as to:

(a) any integral parts, components, attachments or trade accessories of or to the product that are not manufactured by Pierce, including but not limited to engines, transmissions, drivelines, axles, water pumps and generators; with respect to all such parts, components, attachments and accessories, Pierce shall assign to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

(b) any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, fire, exposure to severe environmental or chemical conditions, acidic environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

(c) any vehicle, chassis or component, part, attachment or accessory that has been repaired, altered or assembled in any way by any person or entity other than Pierce which, in the sole judgment of Pierce, adversely affects the performance, stability or purpose for which it was manufactured; or

(d) products or parts which may in the ordinary course wear out and have to be replaced during the warranty period, including, but not limited to, tires, fluids, gaskets and light bulbs. Pierce assumes no responsibility for the assembly of its parts or subassemblies into finishing products or vehicles unless the assembly is performed by Pierce.

The original purchaser may void this warranty in part or in its entirety if the product is repaired or replaced (a) without prior written approval of the Pierce Customer Service Department; or (b) at a facility which has not been approved by Pierce as to technical capability. Any repairs, modifications, alterations or aftermarket parts added after manufacture without the authorization of Pierce may void this warranty.

2. DISCLAIMERS OF WARRANTIES

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3. BUYER'S EXCLUSIVE REMEDY

If the product fails to conform to the warranty set forth in paragraph 1 during the warranty period, and such nonconformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within the time period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Pierce, any allegedly defective product shall be returned to Pierce by Buyer for examination and/or repair. Buyer shall be responsible for the cost of such transportation, and for risk of loss of or damage to the product during transportation. Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expense) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance in writing by Pierce. THIS REMEDY SHALL BE THE EXCLUSIVE AND SOLE REMEDY FOR ANY BREACH OF WARRANTY.

4. EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

Notwithstanding anything to the contrary herein or in any agreement between Pierce and Buyer, IN NO EVENT SHALL PIERCE BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT, OR PUNITIVE DAMAGES WHATSOEVER, WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITY, WITH RESPECT TO VEHICLES OR OTHER PRODUCTS SOLD BY PIERCE, OR THEIR OPERATION OR FAILURE TO OPERATE, OR ANY DEFECTS THEREIN, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATED THERETO, REGARDLESS OF WHETHER PIERCE HAS BEEN INFORMED OF THE POSSIBILITY OF ANY SUCH DAMAGES. Without limiting the generality of the foregoing, Pierce specifically disclaims any liability for property or personal injury damages, penalties, damages for lost profits or revenues, loss of vehicles or products or any associated equipment, cost of substitute vehicles or products, down-time, delay damages, any other types of economic loss, or for any claims by any third party for any such damages.

Note: Any Surety Bond, if a part of the sale of the vehicle as to which this limited warranty is provided, applies only to this Pierce Basic One Year Limited Warranty for such vehicle, and not to other warranties made by Pierce in a separate document (if any) or to the warranties (if any) made by any manufacturer (other than Pierce) of any part, component, attachment or accessory that is incorporated into or attached to the vehicle.



Certification Document CD0156 Statement of Compliance to NFPA 1901-2016 Vehicle Stability

Pierce fire apparatus comply with NFPA 1901 Section 4.13 Vehicle Stability using the tilt table method. As prescribed by the standard, each apparatus is compared to a substantially similar apparatus that has been loaded as required and tested on a tilt table per the SAE J2180 test procedure. If the apparatus configuration was not expected to meet the minimum tilt table criteria, then it will be equipped with the Electronic Stability Control option. A listing of all tested apparatus is maintained by the Research and Development lab and is available for inspection at the Appleton factory.



4.13 Vehicle Stability.

4.13.1* Rollover Stability. The apparatus shall meet the criteria defined in 4.13.1.1, or it shall be equipped with a stability control system in accordance with 4.13.1.2.

4.13.1.1 The apparatus shall meet the criteria defined in either of the following:

- (1)*The apparatus shall remain stable to 26.5 degrees in both directions when tested on a tilt table in accordance with SAE J2180, *A Tilt Table Procedure for Measuring the Static Rollover Threshold for Heavy Trucks*.
- (2) The calculated or measured center of gravity (CG) shall be no higher than 80 percent of the rear axle track width.

4.13.1.1.1 Compliance shall be certified by testing, calculating, or measuring the apparatus or by comparing the apparatus to a compliant, substantially similar example apparatus, and the certification shall be delivered with the fire apparatus.

4.13.1.1.2 The example apparatus shall be considered substantially similar if it includes a chassis with the same or higher CG height, the same or narrower rear axle track width, the same or greater water tank size and CG height, the same type of front and rear suspension, and the same type and size of aerial device.

4.13.1.1.3 For purposes of 4.13.1.1, the apparatus shall be loaded with fuel, fire-fighting agents, hose, ladders, a weight of 250 lb in each seating position, and weight equivalent to the miscellaneous equipment allowance as defined in Table 12.1.2.

4.13.1.1.3.1 If the apparatus is designed to meet a specified higher equipment loading or larger hose bed capacity or to carry additional ground ladders, these greater loads shall be included in the testing, calculating, or measuring.

4.13.1.1.3.2 The weight added to the fire apparatus for the purpose of test, calculation, or measurement shall be distributed to approximate typical in-service use of the fire apparatus while not exceeding the manufacturer's published individual compartment weight ratings.

4.13.1.2 If the apparatus is equipped with a stability control system, the system shall have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls.

VALIDATION TEST: Multiple Tests

Pierce Manufacturing, Inc.

David W. Archer
Vice President of Engineering
June 1, 2017



Certification Document CD0151 Engine Installation – Arrow XT GHG17 Cummins X15 Engine

Pierce Manufacturing, Inc. certifies that the GHG2017 Cummins X15 Engine as installed in an Arrow XT chassis meets the engine installation requirements of the engine manufacturer, the NFPA 1901 and NFPA 1906 guidelines as applicable, and Pierce engine design standards.

Validation testing was conducted in the Pierce wind tunnel chassis dynamometer and cooling test laboratory. Test results have been reviewed and accepted by representatives of the engine supplier.



Pierce Manufacturing, Inc.

David W. Archer
Vice President of Engineering
June 1, 2017



March 13, 2017

Mr. Chad Radtke
Pierce Manufacturing Inc.
2600 American Drive
Appleton, WI 54913

Dear Chad:

We have reviewed the installation of the Cummins 2017 X15 engine in the Arrow XT chassis and have found that the engine models listed below are installed in concurrence with our installation recommendations. Please notify us if there are any changes to the installation of these engines. If any changes are made, they must be reviewed and a new statement will be issued regarding concurrence.

Engine Models Reviewed: X15 600
X15 565
X15 505

Please let me know if you need any additional information.

Sincerely,

Michael Bartkowski
General Sales Manager, OEM On-Highway

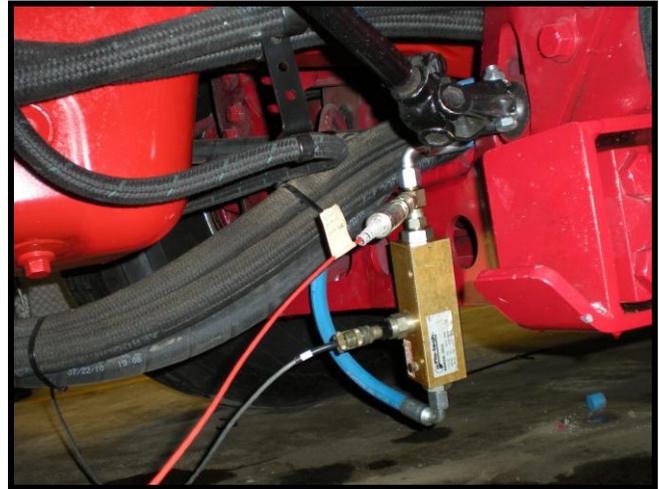
cc: John Schultz, Jon Stege, Kevin Bourgo

Cummins Sales and Service
800 West Ryan Road
Oak Creek, WI 53154
Tel (414) 768-7400
Fax (414) 768-9441
salesandservice.cummins.com



Certification Document CD0098 Power Steering System

Pierce Manufacturing, Inc. certifies that the power steering system as installed in our custom chassis meets the requirements of the component supplier, the NFPA 1901 and NFPA 1906 guidelines as applicable, and Pierce internal design standards.



VALIDATION TEST: RD1987, RD2055
RD2056, RD2057, RD2058, RD2059

Pierce Manufacturing, Inc.

A handwritten signature in black ink, appearing to read "David W. Archer".

David W. Archer
Director of Engineering
June 03, 2011



Certification Document CD0011 Arrow XT® Cab Integrity Certification

Pierce Manufacturing certifies the integrity of the Arrow XT® cab relative to occupant protection.

A specimen representing the substantial structural configuration of the Arrow XT® cab model has been successfully tested in accordance with the following standards.

- SAE J2422 Cab Roof Strength Evaluation – Quasi-Static Loading Heavy Trucks.
- European Occupant Protection Standard ECE Regulation No. 29.
- SAE J2420 COE Frontal Strength Evaluation – Dynamic Loading Heavy Trucks.

Side Impact: The test cab was subjected to dynamic preload where a 13,275 lb moving barrier was slammed into the side of the cab at 5.5 mph, striking with an impact of 13,000 ft-lbs of energy. This test is not required to meet the ECE 29 standard, but is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a roll-over incident.



Roof Crush: This same test cab was then subjected to a roof crush force of 22,050 lbs. This value meets the ECE 29 criteria, which must be equivalent to the front axle rating up to a maximum of 10 metric tons.



Additional Roof Crush: The same cab was then loaded with 60,000 lbs, 72,000 lbs, 80,000 lbs, and finally 100,000 lbs on the roof, exceeding the ECE test by 4.5 times!



Frontal Impact: The test cab was struck by the 13,275 lb moving barrier at a speed sufficient to impart the required 32,600 ft-lbs of energy.

The cab survived this second blow without compromising the survival space of any occupant area.



Additional Frontal Impact: The same cab was then struck a third time at a higher speed to impart 65,200 ft-lbs of energy into the cab (twice the ECE 29 level of energy).

The cab survived this third blow, again without compromising the survival space of any occupant area.

Pass-Fail criteria of the SAE tests and the ECE 29 test is a measure of whether the “survival space” inside the cab is compromised during any of the test loads. The Pierce cab withstood all integrity tests on the same cab without any measurable intrusion into the survival space of the occupant area.

Witnessed and Certified by:

Pierce Manufacturing, Inc.



James Roger Lackore, PE
October 16, 2003



Certification Document CD0002 Arrow XT® Cab Doors

Pierce Manufacturing certifies the integrity of the Arrow XT® cab doors.

Specimens representing the substantial structural configuration of the Arrow XT® cab front and crew doors have been successfully tested to meet the following objectives:

OBJECTIVES:

- Determine the door opening and closing forces before and after a 200,000-cycle door slam test.
- Determine if water leaks past the door seals after a 200,000-cycle door slam test.
- Evaluate components, structure, and mounting of the doors during the test for signs of fatigue.

CONCLUSIONS:

- Door closing forces met acceptable criteria before and after the test.
- Doorframe and door components did not show any signs of fatigue or excessive wear after the 250,000-cycle door slam test.
- The door seals prevented water penetration after 250,000 cycles.

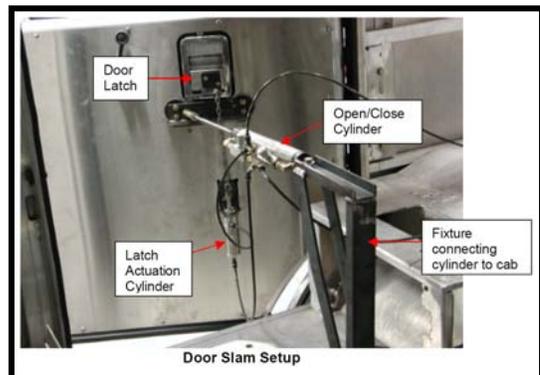
VALIDATION TEST: RD0918

Pierce Manufacturing, Inc.

A handwritten signature in black ink, appearing to read "James R. Lackore".



James Roger Lackore, PE
March 16, 2008





Certification Document CD0006 Arrow XT® Windshield Wiper System

Pierce Manufacturing certifies the integrity of the Arrow XT® Windshield Wiper System.

Specimens representing the configuration of the Arrow XT® windshield wipers have been successfully tested to meet the following objectives:

OBJECTIVES:

- Complete 3,000,000 cycles of windshield wiper operation per SAE J198 § 6.2
- Inspect wiper motor, pivots, linkages, and mounts frequently to validate cumulative wiper system integrity.

CONCLUSIONS:

- The entire wiper system successfully met the goal of 3,000,000 cycles. The wiper motors and arms did not exhibit signs of unusual wear or damage.

VALIDATION TEST: RD0945

Pierce Manufacturing, Inc.

A handwritten signature in black ink, appearing to read "James R. Lackore".



James Roger Lackore, PE
March 16, 2008





Certification Document CD0019 Arrow XT® Seats and Seat Belts

Pierce Manufacturing certifies the conformance of the Arrow XT® cab seats and seat belts to Federal Motor Vehicle Safety Standards. Representative Arrow XT® Seat and Seat Belt designs have been tested successfully in accordance with FMVSS 207.

Physical testing was performed to qualify passenger seats to meet Federal Motor Vehicle Safety Standards (FMVSS) 207 and 210. This requires that a minimum of 3,000 lbf be applied to both the lap and shoulder belts via appropriate body blocks. A third force of twenty times the mass of the seat must be applied at the center-of-gravity (CG) of the seat. All three forces are applied at the same time, reached within thirty seconds of the start of the test, and be held for a minimum of ten seconds.

A force equal to twenty times the mass of the seat was applied to each seat in the direction opposite to the combination pull. A moment of 275 lb-ft was applied to the seat with reference to the H-point.

This testing ensures that the seat mounting and seat belt anchors are adequate to retain the seats and occupants in a crash. The Federal requirements are based on the high deceleration rates of passenger vehicles, so the design requirements are significantly more conservative considering the slower crash speeds of heavy trucks.

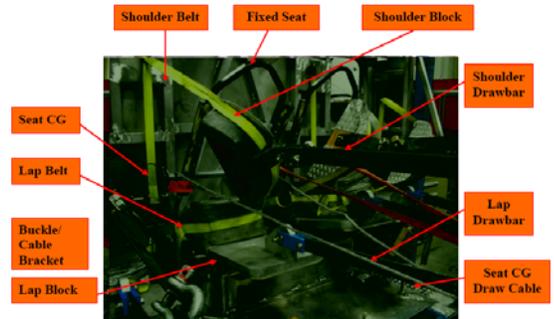


Photo 1
AXT Crew Cab PUO Fixed Seats - Pre-Test Setup

VALIDATION TESTS:

RD1327
RD0862
RD1428

Pierce Manufacturing, Inc.



James Roger Lackore, PE
June 17, 2008

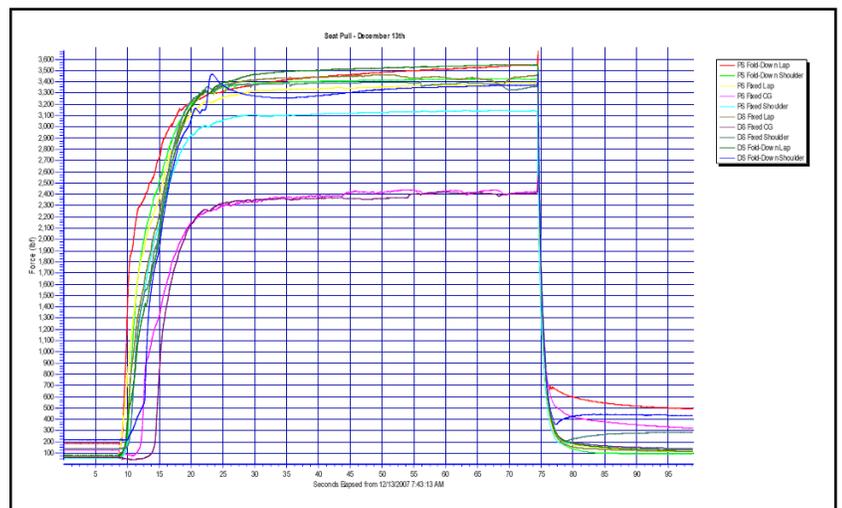


Chart 1 - December 13th Seat Pull Test



Certification Document CD0094 Arrow XT® Cab Heater & Defrost

Pierce Manufacturing certifies the performance of the Arrow XT® cab heat and defroster systems.

The Arrow XT® Heater and Defroster System was tested successfully in an environmental chamber.

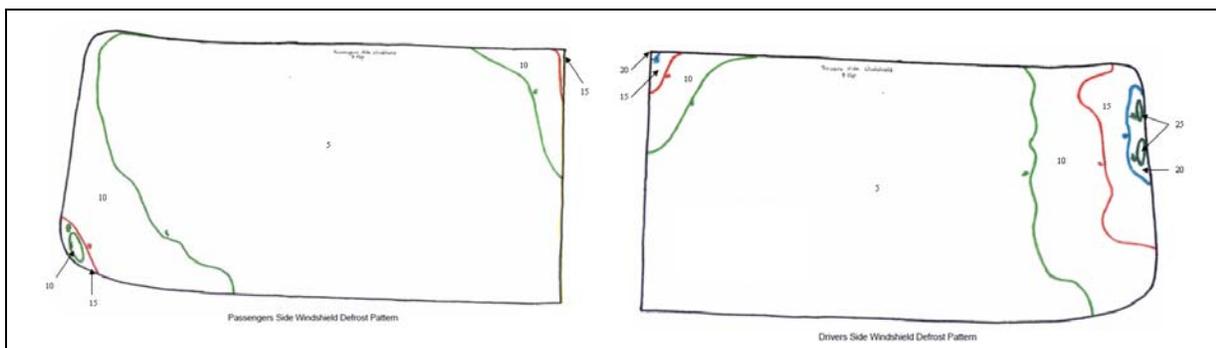
Defrosting

Defroster testing was performed in accordance with *SAE J381 Windshield Defrosting Systems Test Procedure and Performance Requirements-Trucks, Buses, and Multipurpose Vehicles*.

This SAE Recommended Practice establishes uniform test procedures and performance requirements for the defrosting system of enclosed cab trucks, buses, and multipurpose vehicles. Current engineering practice prescribes that for laboratory evaluation of defroster systems, an ice coating of known thickness be applied to the windshield and left- and right-hand side windows to provide more uniform and repeatable test results, even though under actual conditions such a coating would necessarily be scraped off before driving. The test condition, therefore, represents a more severe condition than the actual condition, where the defroster system must merely be capable of maintaining a cleared viewing area.

During the test, the vehicle is cold-soaked to 0° F in a cold chamber. A prescribed layer of ice is applied to the windshield. The defroster is then run and the advancing melt boundary marked as the test proceeds.

The Arrow XT windshield and side windows were 100% cleared within the specified 30 minute period. Approximately 97% of the front windshield area was cleared within 10 minutes. Wipers were not used during the test.



Heater:

Heater testing was performed using the coolant supply procedures from SAE J1612 Cab Heating Systems Test Procedure and Performance Requirements - - *Trucks and Multipurpose Vehicles*.

The average cab temperature increased 77° F from 3° F to 80° F within the prescribed 30 minutes. The cab was contained in a cold chamber at 0° to 5° F during the duration of the test.

VALIDATION TEST: RD1700

Pierce Manufacturing, Inc.



Jeremy Andringa
Chief Engineer - NPD and Production Cab Engineering
December 13, 2010



Certification Document CD0140 Arrow XT® Air Conditioning

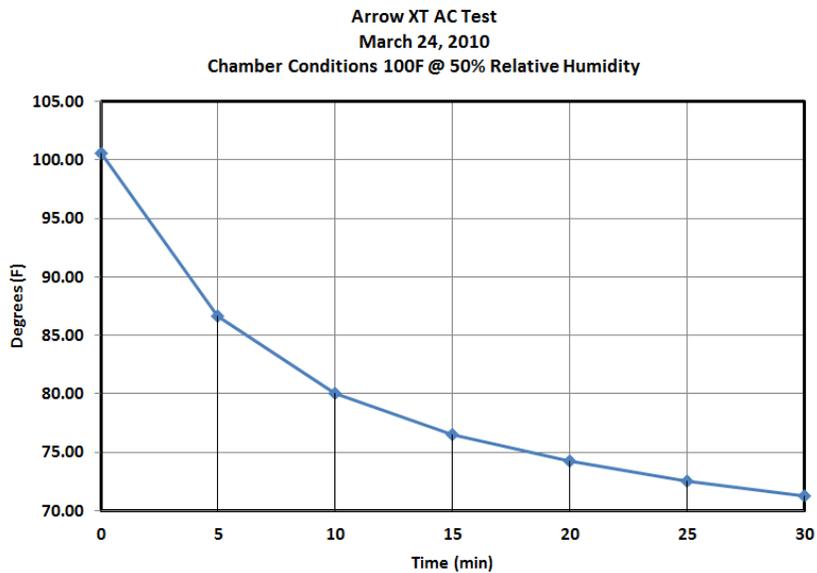
Pierce Manufacturing certifies the performance of the Arrow XT® cab air conditioning system.

The air conditioning system was tested successfully in an environmental chamber.

Air conditioning performance testing was conducted at an ambient of 100°F and 50 percent relative humidity. Engine speed was maintained at high idle rpm with the controls set to maximum cooling.

The vehicle was heat soaked in the environmental chamber. All temperature probes were monitored to confirm temperature stabilization. The transient test began when all the vehicle doors were closed and the air conditioning turned on.

The average cab temperature dropped to 72° F within 30 minutes.



VALIDATION TEST: RD2573

Pierce Manufacturing, Inc.

David W. Archer
Vice President of Engineering

WEIGHT REVIEW ESTIMATE

Job # 825

Reviewed By: NDA

Date Reviewed: 9/6/2019

The following are the estimated fully loaded weights including all people, water/foam, hose, and NFPA equipment allowances:

	<u>Front Axle</u>	<u>Rear Axle</u>	<u>Tiller Axle</u>
Rating	19,000 LB	31,000 LB	22,800 LB
Total Weight	17,865 LB	24,919 LB	20,796 LB
Reserve Capacity	1,135 LB	6,081 LB	2,004 LB
Distribution	28%	39%	33%