Pierce Manufacturing
2600 American Drive
Appleton, Wisconsin
54914

Township of Holmdel

Enforcer Pumper
HGAC
December 5, 2019
Represented in New Jersey
By
FIRE & SAFETY SERVICES, LTD.

200 RYAN STREET
SOUTH PLAINFIELD, NJ 07080
PHONE: 800.400.8017

Main Office and Service / Parts
Fax 908.412.0513
Sales Department
Fax 908.412.0538

FIRE & SAFETY SERVICES

1 HGAC PROPOSAL & OPTIONAL PAYMENTS
2 NJ BUSINESS REGISTRATION & MISCELLANEOUS PAPERWORK
3 AMP DRAW REPORT
4 PIERCE ENFORCER PUMPER PROPOSAL
5 WARRANTIES AND CERTIFICATIONS
6 SERVICE CENTER
7 LITERATURE
8 PRELIMENARY DRAWING
December 4, 2019

Township of Holmdel

Dear Mayor & Council:

Thank you for your interest in purchasing Pierce fire apparatus through the Houston-Galveston Area Council (HGAC) cooperative purchasing program. You may notice that this is being issued in the name of Fire & Safety Services, rather than the manufacturer. Recent accounting regulations have required us to become the prime contractor for all orders, but nothing has changed other than to whom the PO and payments are made.

This letter serves as the quote under the HGAC Contract FS12-19. For this unit we used the base model VC07- Enforcer Pumper.

Pursuant to the regulations established under the HGAC program, we modified that base model to meet your departmental requirements. Pierce is offering an HGAC quoted price of $708,847.15 for the unit.

This apparatus would have a delivery time of 13.5 months from receipt of the purchase order.

*NOTE-* If the Township can order the apparatus prior to 2/1/2020, Pierce Mfg. will offer an additional discount in the amount of ($18,908.12). With the discount applied, the quoted price for the unit would be $689,939.03.

With the HGAC process, since the terms of the agreement have already been negotiated between the vendors and HGAC, there is no need for a separate contract, just a PO made out to Fire & Safety Services Ltd., issued by, you, the customer. Fire & Safety would then send a copy of the official HGAC pricing worksheet along with a copy of the Purchase Order to the HGAC where they would issue an order confirmation. We would also coordinate all paperwork with the manufacturer to start the order with them. We would also provide you a copy of the official HGAC pricing worksheet for your records.

If you have any further questions please do not hesitate to contact us directly or your area sales representative, John O'Keefe

Very truly yours,
David L. Russell
David L. Russell
President
This Worksheet is prepared by Contractor and given to End User. If a PO is issued, both documents MUST be faxed to H-GAC @ 713-993-4548. Therefore please type or print legibly.

**A. Product Item Base Unit Price Per Contractor’s H-GAC Contract:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enforcer Pumper</td>
<td>$492,768.00</td>
</tr>
</tbody>
</table>

**B. Published Options - Itemize below - Attach additional sheet(s) if necessary - Include Option Code in description if applicable.**

(Note: Published Options are options which were submitted and priced in Contractor’s bid.)

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtotal From Additional Sheet(s):</td>
<td>$183,765.00</td>
</tr>
<tr>
<td>Subtotal B:</td>
<td>$183,765.00</td>
</tr>
</tbody>
</table>

**C. Unpublished Options - Itemize below / attach additional sheet(s) if necessary.**

(Note: Unpublished options are items which were not submitted and priced in Contractor’s bid.)

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtotal From Additional Sheet(s):</td>
<td>$32,314.15</td>
</tr>
<tr>
<td>Subtotal C:</td>
<td>$32,314.15</td>
</tr>
</tbody>
</table>

Check: Total cost of Unpublished Options (C) cannot exceed 25% of the total of the Base Unit Price plus Published Options (A+B).

For this transaction the percentage is: 4.78%

**D. Total Cost Before Any Applicable Trade-In / Other Allowances / Discounts (A+B+C):**

| Quantity Ordered: | 1 | X Subtotal of A + B + C: | 708,847.15 | = | Subtotal D: | $708,847.15 |

**E. H-GAC Order Processing Charge (Amount Per Current Policy):**

| Subtotal E: | $2,000.00 |

**F. Trade-Ins / Other Allowances / Special Discounts / Freight / Installation**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor to Pay HGAC Fee</td>
<td>$-2,000.00</td>
</tr>
</tbody>
</table>

Subtotal F: $-2,000.00

| Delivery Date: | 13.5 Months after PO |

**G. Total Purchase Price (D+E+F):**

<p>| $708,847.15 |</p>
<table>
<thead>
<tr>
<th>Number</th>
<th>Qty</th>
<th>Description</th>
<th>Published Options</th>
<th>Unpublished Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>1</td>
<td>Add- Frame Liner</td>
<td>$1,814.00</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>1</td>
<td>Upgrade to 27,000# Rear Axle</td>
<td>$2,189.00</td>
<td></td>
</tr>
<tr>
<td>134</td>
<td>1</td>
<td>Air Inlet</td>
<td>$724.00</td>
<td></td>
</tr>
<tr>
<td>137</td>
<td>1</td>
<td>Brake Fittings- Compression Type</td>
<td>$1,437.00</td>
<td></td>
</tr>
<tr>
<td>141</td>
<td>1</td>
<td>Cummins L9 450hp to Detroit DD13 470hp</td>
<td>$20,187.00</td>
<td></td>
</tr>
<tr>
<td>142</td>
<td>1</td>
<td>Detroit DD13 470 to 525</td>
<td>$4,788.00</td>
<td></td>
</tr>
<tr>
<td>159</td>
<td>1</td>
<td>Add- Extended Front Bumper</td>
<td>$2,335.00</td>
<td></td>
</tr>
<tr>
<td>161</td>
<td>2</td>
<td>Bumper Trays</td>
<td>$1,936.00</td>
<td></td>
</tr>
<tr>
<td>166</td>
<td>1</td>
<td>Linex Bumper Coating</td>
<td>$417.00</td>
<td></td>
</tr>
<tr>
<td>170</td>
<td>1</td>
<td>Raised Roof- Custom Cab</td>
<td>$2,000.00</td>
<td></td>
</tr>
<tr>
<td>171</td>
<td>1</td>
<td>84&quot; Extended Cab</td>
<td>$5,459.00</td>
<td></td>
</tr>
<tr>
<td>172</td>
<td>1</td>
<td>Full Height Cab Doors- Raised Roof</td>
<td>$2,274.00</td>
<td></td>
</tr>
<tr>
<td>174</td>
<td>1</td>
<td>Mounting Plate on Engine Tunnel</td>
<td>$505.00</td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>1</td>
<td>Electric Windows</td>
<td>$2,093.00</td>
<td></td>
</tr>
<tr>
<td>179</td>
<td>1</td>
<td>DELETE- Safety System</td>
<td>-$10,111.00</td>
<td></td>
</tr>
<tr>
<td>208</td>
<td>8</td>
<td>Spare 12V Power</td>
<td>$952.00</td>
<td></td>
</tr>
<tr>
<td>209</td>
<td>1</td>
<td>Radio w/Weatherband</td>
<td>$1,070.00</td>
<td></td>
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<tr>
<td>240</td>
<td>1</td>
<td>Kussmaul Charger</td>
<td>$1,826.00</td>
<td></td>
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<tr>
<td>245</td>
<td>1</td>
<td>Auto-Eject 20A</td>
<td>$541.00</td>
<td></td>
</tr>
<tr>
<td>249</td>
<td>1</td>
<td>Batteries 6-Total</td>
<td>$1,062.00</td>
<td></td>
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<tr>
<td>251</td>
<td>1</td>
<td>430A Niehoff Alternator</td>
<td>$4,574.00</td>
<td></td>
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<tr>
<td>257</td>
<td>2</td>
<td>12V LED Scene</td>
<td>$2,984.00</td>
<td></td>
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<tr>
<td>258</td>
<td>1</td>
<td>DELETE- 12V LED Flood Brow Light</td>
<td>-$2,006.00</td>
<td></td>
</tr>
<tr>
<td>260</td>
<td>1</td>
<td>12V LED Hi-Viz Brow, Full, Single</td>
<td>$4,527.00</td>
<td></td>
</tr>
<tr>
<td>275</td>
<td>1</td>
<td>Hose Bed Cover, Aluminum</td>
<td>$5,853.00</td>
<td></td>
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<tr>
<td>279</td>
<td>1</td>
<td>NY Hose Bed</td>
<td>$2,874.00</td>
<td></td>
</tr>
<tr>
<td>288</td>
<td>2</td>
<td>Catwalk-Hatch Compartment</td>
<td>$7,180.00</td>
<td></td>
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<tr>
<td>290</td>
<td>1</td>
<td>Add- Right High Side Compartment</td>
<td>$3,917.00</td>
<td></td>
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<tr>
<td>291</td>
<td>1</td>
<td>Add- Electric/Hydraulic Ladder Rack</td>
<td>$10,722.00</td>
<td></td>
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<tr>
<td>307</td>
<td>2</td>
<td>Trough- Hard Suction</td>
<td>$3,312.00</td>
<td></td>
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<tr>
<td>308</td>
<td>2</td>
<td>Hard Suction Hose</td>
<td>$2,474.00</td>
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<tr>
<td>310</td>
<td>8</td>
<td>Adjustable Compartment Shelves</td>
<td>$1,600.00</td>
<td></td>
</tr>
<tr>
<td>314</td>
<td>4</td>
<td>Slide-Out Floor Tray</td>
<td>$3,368.00</td>
<td></td>
</tr>
<tr>
<td>325</td>
<td>1</td>
<td>SCBA Cylinder Storage in Fender Panel (single)</td>
<td>$682.00</td>
<td></td>
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<tr>
<td>327</td>
<td>3</td>
<td>SCBA Cylinder Storage in Fender Panel (triple)</td>
<td>$2,877.00</td>
<td></td>
</tr>
<tr>
<td>334</td>
<td>1</td>
<td>Increase Pump from 1250 to 1500 gpm</td>
<td>$2,682.00</td>
<td></td>
</tr>
<tr>
<td>336</td>
<td>1</td>
<td>Increase Pump from 1500 to 2000 gpm</td>
<td>$3,986.00</td>
<td></td>
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<tr>
<td>342</td>
<td>1</td>
<td>Add- 2.5&quot; suction inlet</td>
<td>$1,259.00</td>
<td></td>
</tr>
<tr>
<td>344</td>
<td>2</td>
<td>2.5&quot; Discharge- Front Bumper</td>
<td>$6,246.00</td>
<td></td>
</tr>
<tr>
<td>346</td>
<td>1</td>
<td>Preconnect 2.5 or 3&quot; Plumbing, Sppeed or Cross</td>
<td>$3,436.00</td>
<td></td>
</tr>
<tr>
<td>350</td>
<td>3</td>
<td>2.5&quot; Discharge</td>
<td>$5,424.00</td>
<td></td>
</tr>
<tr>
<td>422</td>
<td>1</td>
<td>Q2B Siren</td>
<td>$4,122.00</td>
<td></td>
</tr>
<tr>
<td>428</td>
<td>1</td>
<td>Traffic Directing Light Bar</td>
<td>$1,536.00</td>
<td></td>
</tr>
<tr>
<td>440</td>
<td>1</td>
<td>Hydraulic 10KW</td>
<td>$22,400.00</td>
<td></td>
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<tr>
<td>453</td>
<td>4</td>
<td>120V 150W LED recessed/flush mount</td>
<td>$8,452.00</td>
<td></td>
</tr>
<tr>
<td>459</td>
<td>1</td>
<td>Electric Cord Reel</td>
<td>$2,727.00</td>
<td></td>
</tr>
<tr>
<td>461</td>
<td>3</td>
<td>Electrical Receptacles</td>
<td>$897.00</td>
<td></td>
</tr>
<tr>
<td>483</td>
<td>1</td>
<td>LED Emergency Light Package Upgrade</td>
<td>$9,062.00</td>
<td></td>
</tr>
<tr>
<td>495</td>
<td>1</td>
<td>Two-Tone Cab Paint</td>
<td>$2,233.00</td>
<td></td>
</tr>
<tr>
<td>504</td>
<td>2</td>
<td>Graphics Upgrade- 2</td>
<td>$5,646.00</td>
<td></td>
</tr>
<tr>
<td>558</td>
<td>1</td>
<td>Deck Gun w/Tips, Manual</td>
<td>$4,668.00</td>
<td></td>
</tr>
<tr>
<td>566</td>
<td>4</td>
<td>Portable Hand Light w/Mounting Bracket</td>
<td>$552.00</td>
<td></td>
</tr>
<tr>
<td>608055</td>
<td>1</td>
<td>Coating, Protective Line-X, Bumper Gravel Pan</td>
<td>$412.87</td>
<td></td>
</tr>
<tr>
<td>Part No.</td>
<td>Description</td>
<td>Price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>770907</td>
<td>Rear Wall, Exterior, Cab, Aluminum Treadplate, Safe-Stride</td>
<td>$957.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>744127</td>
<td>Compt, Storage, Saddle, FH, Transverse Crew Cab, Roll Int, Ext Acc, 84&quot; RR Enf</td>
<td>$6,891.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>797214</td>
<td>Cab Interior, Turnout Tuff, Line-X, Deluxe Level</td>
<td>$6,076.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>615386</td>
<td>Vehicle Information Center, 7&quot; Color Display, Touchscreen, MUX</td>
<td>$2,193.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>606249</td>
<td>Vehicle Data Recorder w/CZ &amp; Overhead Display Seat Belt Monitor</td>
<td>$1,315.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>615112</td>
<td>Pierce Command Zone, Advanced Electronics &amp; Control System, Enforcer, WiFi</td>
<td>$8,244.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>791905</td>
<td>Running Boards, 12.75&quot;, Black Safe-Stride Coating</td>
<td>$895.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>777024</td>
<td>Coating, Top &amp; Bottom edges/Corners, Tailboard, Safe-Stride Coating Black</td>
<td>$932.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>558501</td>
<td>Drawer Assembly, CTECH, 4-Drawers, up to 24&quot; W</td>
<td>$2,019.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>509758</td>
<td>Rub Rail, UPF Black Plastic w/.50&quot; spacer, body sides</td>
<td>$1,907.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>778411</td>
<td>Handrails, Side Pump Panels, Per Print, Hansen, Black</td>
<td>$359.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>778409</td>
<td>Handrails, Beavertail, Standard, Hansen, Black</td>
<td>$108.03</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Base Bid**

$492,768.00

**Published Options**

$183,765.00

**Total Published Options**

$676,533.00

**Unpublished Options**

$32,314.15  4.78%

**Total Options w/o HGAC Fee**

$708,847.15
Optional Credits

The following optional credits and additions are available.

CHASSIS PREPAYMENT OPTIONS

**If the executed Purchase order is received at Fire & Safety Services on or before January 31, 2020:** The purchaser may at their option pay for the chassis, approximately 4 months prior to the apparatus being ready for final inspection at Pierce Mfg. If this payment is made according to terms of the invoice, a credit will be issued on the final invoice, reducing the total purchase price.

- Chassis payment amount: $375,143.00
- Credit amount: $13,332.60

An invoice for the payment will be issued 60 days prior to its due date. In order to qualify for the discount, the payment MUST be made on or before the due date of the invoice.

**If the executed Purchase Order is received at Fire & Safety Services after January 31, 2020:** The purchaser may at their option pay for the chassis, approximately 3-4 months after execution of contract and 4 months prior to the apparatus being ready for final inspection at Pierce Mfg. If this payment is made according to terms of the invoice, a credit will be issued on the final invoice, reducing the total purchase price.

- Chassis payment amount: $386,397.28
- Credit amount: $13,768.57

An invoice for the payment will be issued 60 days prior to its due date. In order to qualify for the discount, the payment MUST be made on or before the due date of the invoice.

The chassis payment is only an option and is in no way required. If you do not decide to exercise this option, the full bid price will be due on delivery of the completed apparatus.
01/29/08

Dear Business Representative:

Congratulations! You are now registered with the New Jersey Division of Revenue.

Use the Taxpayer Identification Number listed above on all correspondence with the Divisions of Revenue and Taxation, as well as with the Department of Labor (if the business is subject to unemployment withholdings). Your tax returns and payments will be filed under this number, and you will be able to access information about your account by referencing it.

Additionally, please note that State law requires all contractors and subcontractors with Public agencies to provide proof of their registration with the Division of Revenue. The law also amended Section 92 of the Casino Control Act, which deals with the casino service industry.

We have attached a Proof of Registration Certificate for your use. To comply with the law, if you are currently under contract or entering into a contract with a State agency, you must provide a copy of the certificate to the contracting agency.

If you have any questions or require more information, feel free to call our Registration Hotline at (809)292-1730.

I wish you continued success in your business endeavors.

Sincerely,

James J. Fruscone
Director
New Jersey Division of Revenue

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

TAXPAYER NAME:
FIRE & SAFETY SERVICES, LTD.

TRADE NAME:

ADDRESS:
200 RYAN ST
SOUTH PLAINFIELD NJ 07080

SEQUENCE NUMBER:
0063498

EFFECTIVE DATE:
09/24/64

ISSUANCE DATE:
01/29/08

James J. Fruscone
Director
New Jersey Division of Revenue

This Certificate is NOT assignable or transferable. It must be conspicuously displayed at all locations where the business is conducted.
CERTIFICATE OF EMPLOYEE INFORMATION REPORT
RENEWAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of 15-SEP-2019 to 15-SEP-2026

FIRE & SAFETY SERVICES, LTD.
200 RYAN STREET
SO. PLAINFIELD  NJ 07080

ELIZABETH MAHER MUOIO
State Treasurer
NON-COLLUSION AFFIDAVIT

State of New Jersey
County of Middlesex

I, David L. Russell, residing in East Windsor
in the County of Mercer and State of New Jersey of full age, being
duly sworn according to law on my oath depose and say that:

I am President of the firm of Fire & Safety Services, Ltd.

the bidder making this Proposal for the bid

entitled Fire Systems, and that I executed the said proposal with
full authority to do so that said bidder has not, directly or indirectly entered into any agreement, participated
in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the
above named project; and that all statements contained in said proposal and in this affidavit are true and
correct, and made with full knowledge that the Township of Holmdel
relies upon the truth of the statements contained in said Proposal

and in the statements contained in this affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such
contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee,
except bona fide employees or bona fide established commercial or selling agencies maintained by Fire &
Safety Services Ltd.

Subscribed and sworn to

before me this day

December 4, 2017

Notary public of

My Commission expires

(Seal)

Peter J. Esemplare
Notary Public
New Jersey
My Commission Expires 4-27-2022
No. 50059582
STOCKHOLDER DISCLOSURE CERTIFICATION

Name of Business:

☒ I certify that the list below contains the names and home addresses of all stockholders holding 10% or more of the issued and outstanding stock of the undersigned.

☐ I certify that no one stockholder owns 10% or more of the issued and outstanding stock of the undersigned.

Check the box that represents the type of business organization:

☐ Partnership ☒ Corporation ☐ Sole Proprietorship

☐ Limited Partnership ☐ Limited Liability Corporation ☐ Limited Liability Partnership

☐ Subchapter S Corporation

Sign and notarize the form below, and, if necessary, complete the stockholder list below.

Stockholders:

<table>
<thead>
<tr>
<th>Name: David L. Russell</th>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Address: 215 Ward Street</td>
<td>Home Address:</td>
</tr>
<tr>
<td>East Windsor, NJ 08520</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name:</th>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Address:</td>
<td>Home Address:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name:</th>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Address:</td>
<td>Home Address:</td>
</tr>
</tbody>
</table>

Subscribed and sworn before me this 4th day of March, 2019

(Notary Public)

My Commission Expires:

Peter J. Esemplare
Notary Public
New Jersey
My Commission Expires 4-27-2022
No. 50059582

(Patient)

(Print name & title of affiant)

(Corporate Seal)
STOCKHOLDER DISCLOSURE CERTIFICATION
This Statement Shall Be Included with Bid Submission

Fire & Safety Services Ltd.

☐ I certify that the list below contains the names and home addresses of all stockholders holding 10% or more of the issued and outstanding stock of the undersigned.

☐ I certify that no one stockholder owns 10% or more of the issued and outstanding stock of the undersigned.

If a corporation owns all or part of the stock of the corporation or partnership submitting the bid, then the statement shall include a list of the stockholders who own 10% or more of the stock of any class of that owning corporation. If no one owns 10% or more stock, attest to that.

Check the box that represents the type of business organization:

☐ Partnership
☐ Limited Partnership
☐ Subchapter S Corporation
☑ Corporation
☐ Limited Liability Corporation
☐ Limited Liability Partnership

Sign and notarize the form below, and, if necessary, complete the stockholder list below.

Stockholders:

Name: David L. Russell
Home Address: 215 Ward Street
East Windsor NJ 08520

Name: __________________________
Home Address: ______________________

Name: __________________________
Home Address: ______________________

Name: __________________________
Home Address: ______________________

Name: __________________________
Home Address: ______________________

Subscribed and sworn before me this ___ day of ______________, 20___

(Notary Public)

My Commission Expires 4-27-2022
No. 50059562
RE: NJ "Buy American" statutory requirement

To Whom It May Concern:

Fire & Safety Services is quoting a Pierce fire apparatus which is built by Pierce Manufacturing, Inc. which is based in Appleton, WI. They manufacture their apparatus in some or part of three manufacturing and assembly facilities that are located in Wisconsin or Florida.

They deal with the federal government procurement programs so at minimum 75% of their component parts are sourced from US based manufacturers or suppliers.

Very truly yours,

David L. Russell
President
STATE OF NEW JERSEY – DIVISION OF PURCHASE AND PROPERTY
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

Quote Number: __________________________ Bidder/Offeror: ____________
Fire & Safety Services Ltd.

PART 1: CERTIFICATION
BIDDERS MUST COMPLETE PART 1 BY CHECKING EITHER BOX.
FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE.

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury’s Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division’s website at http://www.state.nj.us/treas/purchasing/pdf/Chapter25List.pdf. Bidders must review this list prior to completing the below certification. Failure to complete the certification will render a bidder’s proposal non-responsive. If the Director finds a person or entity to be in violation of law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

PLEASE CHECK THE APPROPRIATE BOX:

☐ I certify, pursuant to Public Law 2012, c. 25, that neither the bidder listed above nor any of the bidder’s parents, subsidiaries, or affiliates is listed on the N.J. Department of the Treasury’s list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and am authorized to make this certification on its behalf. I will skip Part 2 and sign and complete the Certification below.

☐ I am unable to certify as above because the bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department’s Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below. Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the boxes below.

EACH BOX WILL PROMPT YOU TO PROVIDE INFORMATION RELATIVE TO THE ABOVE QUESTIONS. PLEASE PROVIDE THOROUGH ANSWERS TO EACH QUESTION. IF YOU NEED TO MAKE ADDITIONAL ENTRIES, CLICK THE "ADD AN ADDITIONAL ACTIVITIES ENTRY" BUTTON.

Name __________________________ Relationship to Bidder/Offeror __________________________

Description of Activities ______________________________________________________________
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

Duration of Engagement __________________________ Anticipated Cessation Date ____________

Bidder/Offeror Contact Name __________________________ Contact Phone Number __________________________

ADD AN ADDITIONAL ACTIVITIES ENTRY

Certification: I, being duly sworn upon my oath, hereby represent and state that the foregoing information and any attachments thereto is true and complete. I attest that I am authorized to execute this certification on behalf of the above-referenced person or entity. I acknowledge that the State of New Jersey is relying on the information contained herein and thereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the State to notify the State in writing of any changes to the answers of information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreement(s) with the State of New Jersey and that the State at its option may declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print): __________________________ Signature: __________________________

Title: __________________________ Date: __________________________

DPP Standard Forms Packet 11/2013
APPENDIX A

AMERICANS WITH DISABILITIES ACT OF 1990
Equal Opportunity for Individuals with Disability

The contractor and the __________ of __________, (hereafter "owner") do hereby agree that the provisions of Title 11 of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C. 12101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant there unto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the owner pursuant to this contract, the contractor agrees that the performance shall be in strict compliance with the Act. In the event that the contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the contractor shall defend the owner in any action or administrative proceeding commenced pursuant to this Act. The contractor shall indemnify, protect, and save harmless the owner, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages, of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the owner’s grievance procedure, the contractor agrees to abide by any decision of the owner which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the owner, or if the owner incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the contractor shall satisfy and discharge the same at its own expense.

The owner shall, as soon as practicable after a claim has been made against it, give written notice thereof to the contractor along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the owner or any of its agents, servants, and employees, the owner shall expeditiously forward or have forwarded to the contractor every demand, complaint, notice, summons, pleading, or other process received by the owner or its representatives.

It is expressly agreed and understood that any approval by the owner of the services provided by the contractor pursuant to this contract will not relieve the contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the owner pursuant to this paragraph.

It is further agreed and understood that the owner assumes no obligation to indemnify or save harmless the contractor, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the contractor's obligations assumed in this Agreement, nor shall they be construed to relieve the contractor from any liability, nor preclude the owner from taking any other actions available to it under any other provisions of the Agreement or otherwise at law.

David L. Russell
October 3, 2017

To Whom it May Concern:

Fire & Safety Services LTD, ("Fire & Safety") is the exclusive dealer for the sale and service of custom and commercial fire apparatus manufactured by Pierce Manufacturing Inc. ("Products") to customers in the state of New Jersey. Although you may have purchased Products directly from Pierce Manufacturing Inc. and/or Fire & Safety in the past, all purchases of Products by customers going forward will be made directly through Fire & Safety.

The change has become necessary due to a new U.S. Generally Accepted Accounting Principle that impacts Pierce Manufacturing Inc. beginning October 1, 2018. Given the build time of Products, this change is being implemented on new contracts beginning October 1, 2017. If required by the customer, bid and performance bonds will continue to be available. Pierce Manufacturing Inc. will continue to provide a manufacturer's insurance certificate as well. This change has no impact on customer access to leasing or financing options on Products sold by Fire & Safety.

If you have any questions, please feel free to contact us.

David Russell  
President  
Fire & Safety Services LTD

Michael E. Pack  
Vice President, Finance  
Pierce Manufacturing Inc.
Request for Taxpayer Identification Number and Certification

Go to www.irs.gov/FormW9 for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

1. Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

Fire & Safety Services, Ltd.

2. Business name/disregarded entity name, if different from above

3. Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.

- Individual (sole proprietor or single-member LLC)
- Corporation
- Partnership
- Trust/estate
- Limited liability company
- Exempt payee code (if any)
- Exemption from FATCA reporting code (if any)

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

4. Print or type your specific instructions on page 2.

5. Address (number, street, and apt. or suite no.) See instructions.

200 Ryan Street

South Plainfield, NJ 07080

6. City, state, and ZIP code

Requestor’s name and address (optional)

7. List account number(s) here (optional)

Part I

Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see How to get a TIN, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see What Name and Number To Give the Requester for guidelines on whose number to enter.

Social security number

or

Employer identification number

Part II

Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and

2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and

3. I am a U.S. citizen or other U.S. person (defined below); and

4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification Instructions. You must cross out Item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, Item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to attach the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here

Signature of U.S. person

Date 3/12/19

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

* Form 1099-INT (interest earned or paid)
## Certificate of Liability Insurance

**Certificate Number:**

<table>
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<tr>
<th>CERTIFICATE NUMBER</th>
<th>REVISION NUMBER</th>
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<tbody>
<tr>
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<tr>
<td>AD-9K722458-19</td>
<td>6/1/2019</td>
</tr>
<tr>
<td>CUP-5N377120-19</td>
<td>6/1/2019</td>
</tr>
<tr>
<td>UB-3N904082-19</td>
<td>6/1/2019</td>
</tr>
<tr>
<td>AD-9K722458-19</td>
<td>6/1/2019</td>
</tr>
</tbody>
</table>

**COVERAGE:**

- **COMMERCIAL GENERAL LIABILITY**
  - CLAIMS-MADE: X
  - OCCUR: X
  - POLICY NUMBER: 660-9K15S285-19
  - POLICY EFF: 6/1/2019
  - POLICY EXP: 6/1/2020
  - LIMITS:
    - EACH OCCURRENCE: $1,000,000
    - DAMAGE TO TENTED PREMISES (EXC. OCCURRENCE): $300,000
    - MED EXP (ANY ONE PERSON): $5,000
    - PERSONAL & ADJURY: $1,000,000
    - GENERAL AGGREGATE: $2,000,000
    - PRODUCTS - COMDPOD AGG: $2,000,000

- **AUTOMOBILE LIABILITY**
  - ANY AUTO
    - OWNED
    - SCHDLED AUTOS
    - HIRED
    - AUTOS ONLY
  - NONOWNED AUTOS ONLY
  - POLICY NUMBER: AD-9K722458-19
  - POLICY EFF: 6/1/2019
  - POLICY EXP: 6/1/2020
  - LIMITS:
    - COMBINED SINGLE LIMIT (EA ACCIDENT): $1,000,000
    - BODY INJURY (PER PERSON): $
    - PROPERTY DAMAGE (PER ACCIDENT): $
    - GENERAL AGGREGATE: $5,000,000

- **UMBRELLA LIABILITY**
  - OCCUR: X
  - CLAIMS-MADE: X
  - POLICY NUMBER: CUP-5N377120-19
  - POLICY EFF: 6/1/2019
  - POLICY EXP: 6/1/2020
  - LIMITS:
    - EACH OCCURRENCE: $5,000,000
    - AGGREGATE: $5,000,000

- **WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY**
  - ANY PROPRIETOR, PARTNER, EXECUTIVE OFFICER, MEMBERS EXCLUDED
  - POLICY NUMBER: UB-3N904082-19
  - POLICY EFF: 6/1/2019
  - POLICY EXP: 6/1/2020
  - LIMITS:
    - E. L. EACH ACCIDENT: $500,000
    - E. L. DISEASE - EA EMPLOYEE: $500,000
    - E. L. DISEASE - POLICY LIMIT: $500,000

- **Garage & Dealers**
  - POLICY NUMBER: AD-9K722458-19
  - POLICY EFF: 6/1/2019
  - POLICY EXP: 6/1/2020
  - LIMIT: $6,000,000

**Certificate Holder:**

- Township of Holmdel
- 4 Crawfords Corner Road
- Holmdel, NJ 07733

**Certificate of Liability Insurance**

**Cancellation:**

Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

**Authorized Representative:**

[Signature]

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The ACORD name and logo are registered marks of ACORD.
# Electrical Analysis

**Bid #:** 445  
**Job #:**  
**Customer:** Holmdel, Township of  
**Sales Rep:** O'Keefe, John  
**Organization:** Fire & Safety Services, Ltd  

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<th>Description</th>
<th>Type*</th>
<th>Minimum Load</th>
<th>Intermittent Load</th>
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<td>152&quot; Hatch, 14&quot; Width, (2) Liftup, Pumper</td>
<td>NFPA</td>
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<td>00525667</td>
<td>Siren, Win 295SLSA1, 100 or 200 Watt</td>
<td>NFPA</td>
<td>1.56</td>
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<td>00540692</td>
<td>Lights, Side Zone Lower, Win M6°C LED, Clear Lens, 3pr, Ovr 25</td>
<td>NFPA</td>
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<td>8.10</td>
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<td>00541155</td>
<td>Lights, Rear/Side Up Zone, Win M9°C LED, Clear Lens 4fts</td>
<td>NFPA</td>
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<td>7.20</td>
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<td>0055630</td>
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<td>NFPA</td>
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<td>NFPA</td>
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<td>0056483</td>
<td>Lights, Tail, Win M6BTT* Red LED Stop/Tail &amp; M6T* Amber LED Dir</td>
<td>NFPA</td>
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<td>00568012</td>
<td>Air Dryer, Wabco System Saver 1200, Heater, 2010</td>
<td>NFPA</td>
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<td>00586382</td>
<td>Gauges, Engine, Included With Pressure Controller</td>
<td>NFPA</td>
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<td>00605126</td>
<td>Pump Shift, Air w/Manual Override, Split Shaft, Interlocked, Waterous</td>
<td>NFPA</td>
<td>1.00</td>
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</tbody>
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* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply
Electrical Analysis

Bid #: 445

Job #: O'Keefe, John

Desc: Holmdel Enforcer Pumper

Customer: Holmdel, Township of

Sales Rep: O'Keefe, John

Organization: Fire & Safety Services, Ltd

Option Description Type* Minimum Load Intermittent Load Total Connected

0607159 Gauge, Water Level, FRC, WLA 300-A00, TankVision Pro NFPA 1.23 0.00 0.00

0610863 Engine, DDC DD13, 525 hp, 1850 lb-ft, WOBD, EPA 2016, Enforcer NFPA 6.00 0.00 0.00

0615386 Vehicle Information Center, 7" Color Display, Touchscreen, MUX NFPA 1.20 0.00 0.00

0620054 Light, Directional/Marker, Intermediate, Weldon 9186-8580-29 LED 2Lts NFPA 0.10 0.90 0.00

0622803 Cab Instruments, Black Gauges, Black Bezels, Enforcer MUX NFPA 1.26 0.00 0.00

0625210 Lights, Directional, Cab Front Side, Truck-Lite 19036Y LED, AXT/Enf NFPA 0.12 0.00 0.00

0625644 Cab, Enforcer, 8410 NFPA 6.80 10.20 0.00

0625953 Light, Directional, Wh 600 Cmb, Cab Cnr, Wrp Bzl Out HD Lts, Enf, NFPA 0.70 0.70 0.00

0627282 Lights, Clearance/Marker/ID, Rear, FRP LED Bar & P25 LED 4Lts NFPA 1.75 0.00 0.00

0628342 Lights, Front Zone, Whn M6** LED, 4Lts Q Bezel NFPA 3.60 5.40 0.00

0634786 Lights, Cab and Crew Cab Access Steps, P25, LED w/Bezel, 1Lt Per NFPA 1.00 0.00 0.00

0640334 152" Hatch, 14" Width, No Doors, Pumper NFPA 1.80 0.00 1.80

0642582 Trans, Allison 5th Gen, 4000 EVS P, w/Prognostics, NFPA 2.00 2.00 0.00

0644179 Wiper Control, 2-Speed with Intermittent, Saber FR/Enforcer NFPA 1.20 4.80 0.00

0645612 Lights, Rear Scene, FRC, SPA900-Q70, 42" - 90" High NFPA 12.00 0.00 0.00

0645877 Lights, Hose Bed, Sides, Dual LED Light Strips NFPA 2.52 0.00 0.00

0647644 Lights, Dome, FRP Dual LED 6 Lts NFPA 1.20 1.20 0.00

0647802 Lights, Clearance/Marker/ID, Front, P25 LED 5 Lts, Saber FR/Enforcer NFPA 0.35 0.00 0.00

0662965 DEF Tank, 4.5 Gallon, DS Fill, Rear of Axle, Common Air Bottle Door NFPA 0.60 11.40 0.00

0664481 Bracket, License Plate & Light, P25 LED NFPA 0.07 0.00 0.00

0665336 Light Shield/Step 8", 4-FRC Firefly LED115-Q01, P25 LED Step Lt NFPA 5.00 0.00 0.00

0682076 Lights, Hatch Compt, Pierce LED, 40" Light Strips, IPOS NFPA 0.40 0.40 0.00

0686745 Light Shield, Sr/S, PS LED, FRC Firefly LED115-Q01, 4Lts NFPA 1.63 0.00 3.17

0692045 Controller, Pressure, FRC, Pump Boss, PBA400 NFPA 1.80 0.00 0.00

0709438 Light, Walking Surf, FRP Flood, LED NFPA 2.00 0.00 0.00

0743381 Compt, Engineers, 25.00" Wide, Transverse, Full Width, Lap Door NFPA 1.80 0.00 1.80

0744127 Compt, Storage, Saddle, FH, Transverse Crew Cab, Roll Int, Ext Acc, NFPA 1.50 1.50 0.00

0745568 Indicator Light, Pump Panel, Ok To Pump, Green NFPA 0.10 0.00 0.00

0756375 Lights, Hyd Lad Rack Deployed, Truck-Lite 15**** NFPA 0.10 0.00 0.00

0769420 Lights, Perimeter Cab, Amcor AY-LB-12HW20 LED 4Dr NFPA 1.20 0.00 0.00

0769572 Lights, Perimeter Pump House, Amcor AY-LB-12HW20 LED 2Lts NFPA 0.58 0.00 0.00

0770056 Lights, Perimeter Body, Amcor AY-LB-12HW20 LED 2Lts, Rear Step NFPA 0.60 0.00 0.00

0783153 Headlights, Rect LED, JW Spkr Evo 2, AXT/DCF/Enf/Imp/Sab/Sab Vel NFPA 4.20 4.20 0.00

0783989 Lightbar, Wh, Freedom IV-Q, 81", RBRBKRWB ____ WBWRBKRK NFPA 6.48 2.48 12.40

0791528 Light, Traffic Directing, Whn TAL55, 36.00" Long, TACTL5 NFPA 0.60 1.20 0.00

0566294 Alternator, 430 amp, Niehoff C680-1 S 0.00 0.00 0.00

Load Totals: 135.96 487.56 294.13

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: 297.00 |
|------------------|------------------|
| Minimum Continuous Load |
| Supply: 297.00 |
| Demand: 135.96 |
| Variance: 161.04 |

| Alternator Output at Governed Speed: 377.00 |
|------------------|------------------|
| Total Connected Load |
| Supply: 377.00 |
| Demand: 303.09 |
| Variance: 73.91 |

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply
TOWNSHIP OF HOLMDEL
PROPOSAL FOR A
TRIPLE COMBINATION PUMPER

Fire & Safety Services, LTD is pleased to submit a proposal to Holmdel for a Pierce® triple combination pumper per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This proposal will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

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

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

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

In accordance with the current edition of NFPA 1901 standards, this 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. Furthermore, all employees classified as welders are tested and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs and American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

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

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

To demonstrate the quality of our products and services, a list of at least twenty (20) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY
The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.
MANUAL AND SERVICE INFORMATION
At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO
At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

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

SERVICE AND WARRANTY SUPPORT
Pierce dealership support will be provided by Fire & Safety Services, Ltd by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within fifty (50) miles of the fire department.

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

Service parts for the apparatus 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 operators manual library is available for easy reference.
Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVT's, and offers hands-on repair and maintenance training classes multiple times a year.

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

INSURANCE PROVIDED BY BIDDER

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

Each Occurrence:$1,000,000
Products/Completed Operations Aggregate:$1,000,000
Personal and Advertising Injury:$1,000,000
General Aggregate:$2,000,000

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

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

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

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

Aggregate:$3,000,000
Each Occurrence:$3,000,000
The umbrella policy will be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile Liability policies.

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

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

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

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

**INSURANCE PROVIDED BY MANUFACTURER**

**PRODUCT LIABILITY INSURANCE**

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

Each Occurrence:$1,000,000

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

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

**UMBRELLA/EXCESS LIABILITY INSURANCE**

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

Each Occurrence:$25,000,000

Aggregate:$25,000,000

The umbrella policy will be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products policies.
The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

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

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

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

**SINGLE SOURCE MANUFACTURER**

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

Your apparatus will be manufactured in Appleton, Wisconsin.

**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.

**NFPA COMPLIANCE**

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.

**PUMP TEST**

Underwriters Laboratory (UL) will test, approved, and certify the pump. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the pump manufacturer's record of pump construction details will be forwarded to the Fire Department.

**GENERATOR TEST**

If the unit has a generator, Underwriters Laboratory (UL) will test, approved, and certify the generator. The test results will be provided to the Fire Department at the time of delivery.

**BREATHING AIR TEST**

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and have the sample certified that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.*
**DELIVERY**
Apparatus, to insure proper break in of all components while still under warranty, will be delivered under it own power. A qualified delivery person representing the contractor shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in the proper operation, care and maintenance of the delivered unit(s).

**CONSTRUCTION REVIEW AND WEEKLY REPORTS**
Fire and Safety Consulting of Appleton Wisconsin, will provide a construction review and a weekly progress report of the apparatus while the apparatus is in production. F & S will review the construction of the unit on a weekly basis. This review will encompass all aspects of construction. F & S will provide a weekly report and accompanying photographs to the sales representative.

**PERFORMANCE BOND, 1 YEAR**
The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this 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.

**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.

**ELECTRICAL WIRING DIAGRAMS**
Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.
ENFORCER CHASSIS
The Pierce Enforcer™ 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, capacity for the intended load to be sustained, and the type of service required. The chassis will be the manufacturer's first line tilt cab.

WHEELBASE
The wheelbase of the vehicle will be 230.50.

GVW RATING
The gross vehicle weight rating will be 49,800.

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 be heat-treated steel measuring 10.25" x 3.50" x .375".

Each rail will have a section modulus of 16.00 cubic inches, yield strength of 120,000 psi, and a resisting bending moment (rbm) of 1,921,069 inch-pounds.

FRAME REINFORCEMENT
A full-length mainframe "C" liner will be provided.

The liner will be an internal "C" design, heat-treated steel measuring 9.38" x 3.13" x .25". Each reinforcement member will have a section modulus of 3.90 cubic inches, yield strength of 120,000 psi and resisting bending moment (rbm) of 938,762 in-lb.

In addition, a L-shaped steel channel reinforcement will be located under each mainframe rail.

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

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

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

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.
There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

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

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

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

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

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

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

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

**FRONT SUSPENSION**

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

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

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

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

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

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

**FRONT SHOCK ABSORBERS**

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.
FRONT OIL SEALS
Oil seals with viewing window will be provided on the front axle.

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

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

REAR AXLE
The rear axle will be a Meritor™, Model RS-26-185, with a capacity of 27,000 lb.

TOP SPEED OF VEHICLE
A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 65 MPH.

REAR SUSPENSION
The rear suspension will be a Reyco Model 79KB with a ground rating of 27,000 lb. Spring hangers and mounting components will be cast. The suspension utilizes two (2) attaching points with variable rate spring cams and rubber bushed adjustable torque arms.

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

REAR TIRES
Rear tires will be four (4) Goodyear® 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Accuride® 22.50" x 8.25" steel disc type 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 six (6) 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.

**REAR HUB COVERS**
A pair of stainless steel high hat hub covers will be provided on rear axle hubs.

**CHROME LUG NUT COVERS**
Chrome lug nut covers will be supplied on front and rear wheels.

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

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

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

**ANTI-LOCK BRAKE SYSTEM**
The vehicle will be equipped with a Meritor WABCO 4S4M, anti-lock braking system. The ABS will provide a 4-channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any 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.

**BRAKES**
The service brake system will be full air type.

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

The brake system will be certified, third party inspected, for improved stopping distance.
The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

**AIR COMPRESSOR, BRAKE SYSTEM**
The air compressor will be a Bendix®, Model BA-921, with 15.80 cubic feet per minute output at 1,250 rpm.

**BRAKE SYSTEM**
The brake system will include:

- Brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system minimum capacity of 4,272 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
- 1/4 turn drain valves on each air tank

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

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

**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.

**AIR INLET WITH AUTOMATIC EJECT**
One (1) air inlet with Kussmaul Air Eject will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will automatically disconnect the air line when the truck is started. It will be equipped with a male coupling and be located on the driver side exterior of cab, above the front wheel, behind the cab door, recessed into the cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female coupling will also be provided with the loose equipment.
COVER OVER AIR INLET
A Kussmaul, Model 091-28-AK, weatherproof red cover will be provided over the recessed automatic air line disconnect.

COLOR CODE RESERVOIRS
The chassis air reservoirs will be painted for easy identification. Depending on the air tanks installed on the chassis, the following color scheme will be provided (not all tank types may be on a chassis):

Supply tank will be black, primary tank will be green, secondary tank will be blue and auxiliary tank (s) will be yellow.

COMPRESSION FITTINGS ONLY
Any nylon tube on the brake system that is pneumatic will be plumbed with compression type fittings where applicable. Push lock fittings will not be acceptable for any pneumatic nylon tube plumbing.

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

<table>
<thead>
<tr>
<th>Make:</th>
<th>Detroit™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model:</td>
<td>DD13®</td>
</tr>
<tr>
<td>Power:</td>
<td>525 hp at 1625 rpm</td>
</tr>
<tr>
<td>Torque:</td>
<td>1850 lb-ft at 1075 rpm</td>
</tr>
<tr>
<td>Governed Speed:</td>
<td>Full Load - 1900 rpm Road/2080 rpm Parked PTO</td>
</tr>
<tr>
<td>Emissions Certification:</td>
<td>EPA 2016 (GHG17)</td>
</tr>
<tr>
<td>Fuel:</td>
<td>Diesel</td>
</tr>
<tr>
<td>Cylinders:</td>
<td>Six (6)</td>
</tr>
<tr>
<td>Displacement:</td>
<td>781 cubic inches (12.8L)</td>
</tr>
<tr>
<td>Starter:</td>
<td>Delco Remy 39MT™</td>
</tr>
<tr>
<td>Fuel Filters:</td>
<td>Dual cartridge style with check valve, water separator, and water in fuel sensor</td>
</tr>
</tbody>
</table>

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."

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

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

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

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

CLUTCH FAN
A fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and constantly engaged when in "Pump" position.

ENGINE AIR INTAKE
The engine air intake will be located above the engine cooling package. It will draw fresh air from the front of the apparatus through the radiator grille.

A stainless steel metal screen will be installed at the inlet of the air intake system that will meet NFPA 1901 requirements.

The air cleaner and stainless steel screen will be easily accessible by tilting the cab.

EXHAUST SYSTEM
The exhaust system will include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipes between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.
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 radiator core will consist of aluminum fins, having a serpentine design, brazed to aluminum tubes.

The radiator core will have a minimum front area of 1060 square inches.

Supply tank will be made of heavy duty glass-reinforced nylon and the return tank will be made of aluminum. Both tanks will be crimped onto the core assembly using header tabs and a compression gasket to complete the radiator core assembly. There will be a full steel frame around the inserts to enhance cooling system durability and reliability.

The radiator will be compatible with commercial antifreeze solutions.

The radiator assembly will be isolated from the chassis frame rails with rubber isolators to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven terrain.

The radiator will include a de-aeration/expansion 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.

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.

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

A 0.75" drain plug will be located in a low point of the tank for drainage.
A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

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

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

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

**DIESEL EXHAUST FLUID TANK**

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body rearward 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 provided and marked "Diesel Exhaust Fluid Only". The fill inlet will be located adjacent to the air bottle storage behind a common door on the driver side of the vehicle.

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

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

**AUXILIARY FUEL PUMP**

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

**FUEL SHUTOFF**

A shutoff valve will be installed in the fuel line, at the fuel tank.

**FUEL COOLER**

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

**TRANSMISSION**

An Allison 5th generation, Model EVS 4000P, electronic, torque converting, automatic transmission 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 buzzer will be installed on the cab instrument panel.

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

The transmission ratio will be:

<table>
<thead>
<tr>
<th>Gear</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>3.51 to 1.00</td>
</tr>
<tr>
<td>2nd</td>
<td>1.91 to 1.00</td>
</tr>
<tr>
<td>3rd</td>
<td>1.43 to 1.00</td>
</tr>
<tr>
<td>4th</td>
<td>1.00 to 1.00</td>
</tr>
<tr>
<td>5th</td>
<td>0.75 to 1.00</td>
</tr>
<tr>
<td>6th</td>
<td>0.64 to 1.00</td>
</tr>
<tr>
<td>R</td>
<td>4.80 to 1.00</td>
</tr>
</tbody>
</table>

**TRANSMISSION COOLER**
A Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.

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

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

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

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

**STEERING WHEEL**
The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 2-spoke design.
LOGO AND CUSTOMER DESIGNATION ON DASH
The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be:

The second row of text will be:

The third row of text will be:

BUMPER
A one (1)-piece bumper manufactured from .25" formed steel with a .38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange, and will extend 26.00" from the face of the cab. The bumper will be 95.28" wide with 45 degree corners and side plates. 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.

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.

CENTER HOSE TRAY RESTRAINT
There will be one (1) pair of hose tray restraint straps located over the center mounted tray.

The restraints will be a pair of 2.00" wide black nylon straps with Velcro® fasteners provided. The strap(s) will be used to secure the hose in the tray.

LEFT SIDE HOSE TRAY
A hose tray will be placed in the left side of the extended bumper.

The tray will have a capacity of 175' of 1.75" double jacket cotton-polyester hose.

The top edge of the riser will be trimmed with round aluminum extrusion.

Black rubber grating will be provided at the bottom of the tray. Drain holes will be provided.
BUMPER HOSE RESTRAINT
There will be one (1) pair hose tray restraint straps located over the left side mounted tray. The restraints will be a pair of 2.00" wide black nylon straps with Velcro fasteners provided. The strap(s) will be used to secure the hose in the tray.

RIGHT SIDE HOSE TRAY
A hose tray will be placed in the right side of the extended bumper. The tray will have a capacity of 175' of 1.75" double jacket cotton-polyester hose. The top edge of the riser shall be trimmed with round aluminum extrusion. Black rubber grating will be provided at the bottom of the tray. Drain holes will be provided.

BUMPER HOSE RESTRAINT
There will be one (1) pair hose tray restraint straps over the right side hose tray. The restraints will be a pair of 2.00" wide black nylon straps with Velcro fasteners provided. The strap(s) will be used to secure the hose in the tray.

TOW HOOKS
Two (2) painted steel tow hooks will be installed under the bumper and attached to the front frame members. The tow hooks will be painted to match the chassis frame assembly.

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

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 center of the bumper.

PROTECTIVE COATING ON BUMPER GRAVEL PAN
A protective Line-X® spray-on polyurethane/polyurea coating will be applied to top surface of the bumper gravel pan.

The coating will be black in color.

The coating will be properly installed by an authorized Line-X dealer.

FRONT BUMPER LINE-X COATING
Protective black Line-X® coating will be provided on the outside exterior of the top front bumper flange. It will not be sprayed on the underside of the flange.
The lining will be properly installed by an authorized Line-X dealer.

**CAB**
The Enforcer cab will be designed specifically for the fire service and 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 a 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 castings. The B-pillar and C-pillar will be constructed from 0.13" wall extrusions. The rear wall will be constructed of two (2) 2.00" x 2.00" outer aluminum extrusions and two (2) 2.00" x 1.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 4.625" x 3.864" x 0.090" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.25" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.13" firewall plate, covered with a 0.090" front skin (for a total thickness of 0.22"), and reinforced with a full width x 0.50" thick cross-cab support located just below the windshield and fully welded to the engine tunnel. The cross-cab support will run the full width of the cab and weld to each A-pillar, the 0.13" firewall plate, and the front skin.

The cab floors will be constructed of 0.125" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.375" of structural material at the front floor area. The front floor area will also be supported with two (2) triangular 0.30" wall extrusions that also provides the mounting point for the cab lift. This tubing will run from the floor wireway of the cab to the engine tunnel side plates, creating the structure to support the forces created when lifting the cab.

The cab will be 96.00" 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 99.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 109.00". The overall height listed will be calculated based on a truck configuration with the lowest suspension weight rating, 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 64.50" in the center and outboard positions.

The crew cab floor will measure 60.00" from the rear wall to the back side of the rear facing seat risers.

The medium block engine tunnel, at the rearward highest point (knee level), will measure 76.00" to the rear wall. The big block engine tunnel will measure 66.00" to the rear wall.

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

The 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 painted to match the cab roof, and 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 1.00" insulation in the ceiling, 1.50" insulation in the side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

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

**PANORAMIC WINDSHIELD**
A one (1)-piece safety glass windshield will be provided with over 2,775 square inches of clear viewing area. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: outer light, middle safety laminate, and inner light. The outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom irit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

**WINDSHIELD WIPERS**
Three (3) 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.
ENGINE TUNNEL
Engine hood side walls will be constructed of 0.375" aluminum. The top will be constructed of 0.125" 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.

The engine tunnel will be no higher than 17.00" off the crew cab floor.

CAB REAR WALL COATING
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.

The exterior aluminum treadplate will be coated with Safe-Stride® black non-slip surface treatment.

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.

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

Lift controls will be located on the right side pump panel or front area of the body in a convenient location.

The cab will be capable of tilting 43 degrees to accommodate engine maintenance and removal.

The cab will be locked down by a 2-point normally closed spring loaded hook type latch that fully engages after the cab has been lowered. The system will be hydraulically actuated to release the normally closed locks when the cab lift control is in the raised position and cab lift system is under pressure. When the cab is completely lowered and system pressure has been relieved, the spring loaded latch mechanisms will return to the normally closed and locked position.

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 left side between the chassis and cab frame when the cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.
**Cab Lift Interlock**
The cab lift system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

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

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

**MIRRORS**
A Retrac, Model 613422, dual vision, motorized, west coast style mirror with black finish will be mounted on each side of the front cab door with chrome 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 75.50" 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 door openings will be a minimum of 34.30" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.093". The exterior door skins will be constructed from 0.090" aluminum.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands.

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

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 751. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.
A 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.

A chrome grab handle will be provided on the inside of each cab door for ease of entry.

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

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

**Door Panels**
The inner cab door panels will be constructed out of painted aluminum.

**ELECTRIC OPERATED CAB DOOR WINDOWS**
All four (4) cab doors will be equipped with electric operated windows with one (1) flush mounted automotive style switch on each door. The driver's door will have four (4) switches, one (1) to control each door window.

Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second.

**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 25.00" wide, and the crew cab steps will be 21.65" wide with a 10.00" minimum depth. The inside cab steps will not exceed 16.50" in height.

The steps and vertical surfaces of the step wells will be coated with black Safe-Stride® slip resistant material.

**CAB EXTERIOR HANDRAILS**
A Hansen 1.25" diameter slip-resistant, black anodized knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress. Each handrail will be e-coated and have black powder coated stanchions.

**STEP LIGHTS**
There shall be six (6) white LED step lights installed for cab and crew cab access steps.

- One (1) light for the driver's access steps.
- Two (2) lights for the driver's side crew cab access steps.
- Two (2) lights for the passenger's side crew cab access steps.
- One (1) light for the passenger's side access step.

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

The lights shall be activated when the battery switch is on and the adjacent door is opened.

**FENDER CROWNS**
Rubber fender crowns will be provided around the cab wheel openings.

Crowns will be black.

**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 18.70" wide x 23.75" high.

**REAR WALL WINDOWS**
There will be two (2) windows, located one (1) each side, on the rear wall of the crew cab. The windows will measure 14.75" wide x 7.25" high.

**STORAGE COMPARTMENT**
Provided at the forward facing left and right side crew cab positions behind the crew cab doors will be a full height compartment with internal and external access. Each compartment will be open from top to bottom with no dividers. A transverse compartment will be provided under the forward facing crew cab seats that is accessible to both the left and right sides.

The lower section will be 24.50" wide x 25.50" high x 15.00" deep. The upper section will be 30.25" wide x 60.00" high x 22.00" deep. The lower 9.00" of the upper section will be full width (transverse) of the crew cab.

There will be interior access in each upper section, above the transverse section, with two (2) Gortie rollup doors with satin finish, non-locking. One (1) door will be located on the left side compartment and one (1) on the right side compartment. The frame to frame opening of each outboard cabinet will be 19.50" wide x 44.75" high. The minimum clear door opening will be 16.75" wide x 38.87" high.

There will be exterior access provided with two (2) double pan doors painted to match the cab exterior with a non-locking, black finish D-Ring latch, one (1) on each side of the cab. A cable for each exterior door will be provided as a door stop.
There will be one (1) drop down door, single pan construction, on the forward face of the seat riser. The drop down door will include two (2) flush quarter turn latches.

The compartment interior will be painted spatter gray.

**Compartment Light**
There will be eight (8) white Amdor LED strip lights, one (1) each side of lower and upper exterior compartment door opening. The lights will be controlled by an automatic door switch.

**MOUNTING PLATE ON ENGINE TUNNEL**
Equipment installation provisions will be installed on the engine tunnel.

A 0.188" smooth aluminum plate will be bolted to the top surface of the engine tunnel. The plate will follow the contour of the engine tunnel and will run the entire length of the engine tunnel. The plate will be spaced off the engine tunnel 1.00" to allow for wire routing below the plate.

The mounting surface will be painted to match the cab interior.

**CAB INTERIOR**
The cab interior will be constructed of aluminum to withstand the severe duty cycles of the fire service.

The officer side dash will be a flat faced design to provide easy maintenance and will be constructed out of aluminum.

The instrument cluster will be surrounded with a high impact ABS plastic contoured to the same shape of the instrument cluster.

The following items will be sprayed with black polyurethane/polyurea elastomer abrasive resistant material. The abrasive resistant material will be properly sprayed by an authorized Line-X® dealer.

- Modesty panel in front of driver
- Officer side dash
- Overhead switch panel
- Glove box in front of officer (if applicable)
- Power distribution in front of officer
- Radio compartment below the officer seat (if applicable)
- Engine tunnel
- Fluid check access door
- Scuffplate on bottom rear of engine tunnel
- Evaporator drain tubes
- Permanent and bolt-in seat risers
- Side wall panels below the crew cab windows
- Side wall panels to the rear and above the crew cab windows
- Rear wall panels
- Heater face plates
- Driver side lower wireway covers
- Officer side lower wireway covers
- Upper wireway covers
- Vertical door sills
- PUC notch (if applicable)

Headliner will be installed in both forward and rear cab sections. Headliner material will be Turnout Tuff fabric. 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 permit easy access for service of electrical wiring or other maintenance needs.

All wiring will be placed in metal raceways.

**CAB INTERIOR UPHOLSTERY**
The cab interior upholstery will be black.

**CAB INTERIOR PAINT**
The cab interior metal surfaces, excluding the rear heater panels, will be painted black, vinyl texture paint.

The rear heater panels will be painted black, vinyl textured paint.

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

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

**CAB DEFROSTER**
To provide maximum defrost and heating performance, a 43,500 BTU heater-defroster unit with 350 CFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the vacuum formed instrument panel. For easy access, a removable vacuum formed cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. The defroster will be capable of clearing 98 percent of the
windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

**CAB/CREW CAB HEATER**

Two (2) 44,180 BTU auxiliary heaters with 276 CFM (each unit) of air flow will be provided inside the crew cab, one (1) in each outboard rear-facing seat riser. The heaters will include high performance dual scroll blowers, one (1) for each unit. Outlets for the heaters will be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions.

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

**AIR CONDITIONING**

A high performance, customized air conditioning system will be furnished inside the cab and crew cab.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit within 30 minutes at 50 percent relative humidity. 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 radiator mounted condenser with a 59,644 BTU output that meets and exceed the performance specification will be installed.

One (1) evaporator unit will be installed in the center roof with two (2) cores, one (1) for the cab and one (1) for the crew cab. The evaporator unit will have an adequate BTU rating to meet the performance specifications.

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

- Four (4) will be directed towards the driver's location
- Four (4) will be directed towards the officer's location
- Seven (7) will be directed towards the crew cab area

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

**Gravity Drain Tubes**
Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. No pumps will be provided.

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

**TRACER DIE**
There will be tracer dye installed in the air conditioning system for leak detection.

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

There will be a polished stainless steel bracket provided to help secure each sun visor in the stowed position.

**GRAB HANDLES**
A black rubber covered grab handle will be mounted on the door post of the driver and officer's side cab door to assist in entering the cab. The grab handles will be securely mounted to the post area between the door and windshield.

**ENGINE COMPARTMENT LIGHTS**
There will be one (1) Whelen, Model 3SC0CDCR, 12 volt DC, 3.00" white LED light(s) with Whelen, Model 3FLANGEC, chrome flange kit(s) installed under the cab to be used as engine compartment illumination.

These light(s) will be activated automatically when the cab is raised.

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

DRIVER SEAT
A seat will be provided in the cab for the driver. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have an adjustable reclining back. The seat back will be a high back style with side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will be furnished with a 3-point, shoulder type seat belt.

OFFICER SEAT
A seat will be provided in the cab for the passenger. The seat will be a fixed type with no suspension. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

RADIO COMPARTMENT
A radio compartment will be provided under the officer’s seat.

The inside compartment dimensions will be 16.00" wide x 7.50" high x 15.00" deep, with the back of the compartment angled up to match the cab structure.

A drop-down door with a chrome plated lift and turn latch will be provided for access.

The compartment will be constructed of smooth aluminum and painted to match the cab interior.

REAR FACING DRIVER SIDE OUTBOARD SEAT
There will be one (1) rear facing seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.
The seat will be furnished with a 3-point, shoulder type seat belt.

**REAR FACING PASSENGER SIDE OUTBOARD SEAT**
There will be one (1) rear facing seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

**FORWARD FACING CENTER SEATS**
There will be two (2) forward facing seats provided at the center position in the crew cab. For optimal comfort, the seats will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA style with 90 degree back. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats will be furnished with a 3-point, shoulder type seat belt.

**SEAT UPHOLSTERY**
All seat upholstery will be black Turnout Tuff material.

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

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

**SEAT BELTS**
All cab and tiller cab (if applicable) seating positions 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 include height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter. The 3-point shoulder type
seat belts will be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

The 3-point shoulder type 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.

To ensure safe operation, the seats will 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.

**HELMET STORAGE**

Helmet storage will be located in a body compartment.

**CAB DOME LIGHTS**

There will be six (6) dual LED dome lights with black bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and four (4) lights will be installed and located, two (2) on each side of the crew cab.

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

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

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

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

**HAND HELD LIGHT**

There will be four (4) Streamlight, Fire Vulcan, Model #44451, hand lights provided with a vehicle mount with 12VDC direct wire charging rack and quick release buckle strap mounted as directed at the pre-construction meeting.

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

**CAB INSTRUMENTATION**

The cab instrument panel will be a molded ABS panel and include gauges, an LCD display, telltale indicator lamps, control switches, alarms, and a diagnostic panel. The function of the 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, forward of the driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.
GAUGES
The gauge panel will include the following ten (10) black faced gauges with black bezels to monitor vehicle performance:

- Voltmeter gauge (volts):
  - Low volts (11.8 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - High volts (15.5 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low volts (11.3 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
  - Very high volts (16.0 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly

- Engine Tachometer (RPM)
- Speedometer MPH (Major Scale), KM/H (Minor Scale)
- Fuel level gauge (Empty - Full in fractions):
  - Low fuel (1/8 full)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low fuel (1/32 full)
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly

- Engine Oil pressure Gauge (PSI):
  - Low oil pressure to activate engine warning lights and alarms
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly

- Front Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly

- Rear Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly

- Transmission Oil Temperature Gauge (Fahrenheit):
  - High transmission oil temperature activates warning lights and alarm
• Amber caution indicator on the information center with intermittent alarm
• Amber caution light on gauge assembly

• Engine Coolant Temperature Gauge (Fahrenheit):
  o High engine temperature activates an engine warning light and alarms
  • Amber caution indicator on the information center with intermittent alarm
  • Amber caution light on gauge assembly

• Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
  o Low fluid (1/8 full)
  • Amber indicator light in gauge dial

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

**INDICATOR LAMPS**
To promote safety, the following telltale indicator lamps will be located on the instrument panel in clear view of the driver. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

• Low coolant
• Trac cntl (traction control) (where applicable
• Check engin
• Check trans (check transmission
• Aux brake overheat (Auxiliary brake overheat
• Air rest (air restriction)
• Caution (triangle symbol)
• Water in fuel
• DPF (engine diesel particulate filter regeneration)
• Trailer ABS (where applicable)
• Wait to start (where applicable)
• HET (engine high exhaust temperature) (where applicable)
• ABS (antilock brake system)
• MIL (engine emissions system malfunction indicator lamp) (where applicable)
• Side roll fault (where applicable)
• Front air bag fault (where applicable)

The following red telltale lamps will be present:

• Warning (stop sign symbol)
• Seat belt
• Parking brake
• Stop engine
• Rack down
The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

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

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

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

**INDICATOR LAMP AND ALARM PROVE-OUT**
A system will be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

**CONTROL SWITCHES**
For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches will have backlit labels for low light applications.

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

Panel back lighting intensity control switch: A three (3)-position momentary rocker switch will be provided. Pressing the top half of the switch, "Panel Up" increases the panel back lighting intensity and pressing the bottom half of the switch, "Panel Down" decreases the panel back lighting intensity. Pressing the half or bottom half of the switch several times will allow back lighting intensity to be gradually varied from minimum to maximum intensity level for ease of use.
Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will turn off and deactivate vehicle ignition. The second switch position will activate vehicle ignition and will perform prove-out on the telltale indicators and alarms for 3 to 5 seconds after the switch is turned on. A green indicator lamp is activated with vehicle ignition. The third momentary position will temporarily silence all active cab alarms. An alarm "chirp" may continue as long as alarm condition exists. Switching ignition to off position will terminate the alarm silence feature and reset function of cab alarm system.

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.

Hazard switch will be provided on the instrument panel or on the steering column.

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

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

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

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

High idle engagement switch: A momentary rocker switch with integral indicator lamp will be provided. The switch will activate and deactivate the high idle function. 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.

Emergency switching will be controlled by multiple individual warning light switches for various groups or areas of emergency warning lights. An Emergency Master switch provided on the instrument panel that enables or disables all individual warning light switches is included.
An additional "Emergency Master" button will be provided on the lower left hand corner of the gauge panel to allow convenient control of the "Emergency Master" system from inside the driver's door when standing on the ground.

**CUSTOM SWITCH PANELS**
The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the lower instrument console and up to six (6) switch panels in the overhead visor console. All switches have backlit labels for low light conditions.

**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
- Roll sensor diagnostic port
- 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 the following, along with other configuration specific information:

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

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

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

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

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

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed
Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

**SWITCH PANELS**
The built-in switch panels will be located in the lower console or overhead console of the cab.

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.

**WIPER CONTROL**
Wiper control will consist of a two (2)-speed windshield wiper control with intermittent feature and windshield washer controls.

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

The above wires will have the following features:

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

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

**SPARE CIRCUIT**
There will be 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 6 amps at 12 volts DC.
- Power and ground will terminate in the switch panel in the center dash.
- Termination will be a Kussmaul part number 091-219-5, switch panel 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.

**SPARE CIRCUIT**
There will be four (4) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

• The positive wire will be connected directly to the battery power
• The negative wire will be connected to ground
• Wires will be protected to 20 amps at 12 volts DC
• Power and ground will terminate as directed at the pre-construction meeting
• 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 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 ignition switched power.
• The negative wire will be connected to ground.
• Wires will be protected to 2.0 amps at 12 volts DC.
• Power and ground will terminate on the rear face of the engine tunnel.
• Termination will be a Blue Sea Systems part number 1016 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.

**STEREO RADIO**
A Jensen, heavy duty AM/FM/CD/Weatherband stereo radio, with front auxiliary input will be installed within reach of the officer. There will be 5.25" speakers installed one (1) pair of 5.25" speakers in the cab and one (1) pair of 5.25" speakers in the crew cab. The antenna will be a roof-mounted rubber antenna located in an open space, on the cab roof.

The following features will be included:

• CD Player with Electronic Skip Protection (ESP)
• Full 7-Channel NOAA Weatherband Tuner with SAME technology
• Built-in Clock
• Audio CD, CD-R, R/W, MP3 CD compatible
• Radio Broadcast Data System Text Display
• Front panel USB input
• Front and Rear Auxiliary Audio Input
• Receives audio (A2DP/AVRCP) from Bluetooth enabled device
• Supports Bluetooth HFP to receive phone calls from BT-enabled phones
• Low battery alert (&lt;10.8Vdc)
• Heavy Duty design with Conformal Coated Circuit Boards for maximum durability under all conditions

**SWITCH, MASTER, AM/FM RADIO**

There will be a remote switch provided inside the cab to control the AM/FM radio. The switch will be installed by the driver. The radio will automatically turn on with when the battery switch is turned on.

**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
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

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

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

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

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

- Diagnostics
  - Faults
    - Listed by order of occurrence
    - Allows to sort by system
  - Interlock
    - Throttle Interlocks
    - Pump Interlocks (if equipped)
    - Aerial Interlocks (if equipped)
    - PTO Interlocks (if equipped)
  - Load Manager
    - A list of items to be load managed will be provided. The list will provide a description of the load.
    - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
    - The screen will indicate if a load has been shed (disabled) or not shed.
    - "At a glance" color features are utilized on this screen.
  - Systems
    - Command Zone
      - Module type and ID number
      - Module Version
      - Input or output number
      - Circuit number connected to that input or output
      - Status of the input or output
      - Power and Constant Current module diagnostic information
    - Foam (if equipped)
    - Pressure Controller (if equipped)
    - Generator Frequency (if equipped)
  - Live Data
    - General Truck Data
- Maintenance
  - Engine oil and filter
  - Transmission oil and filter
  - Pump oil (if equipped)
  - Foam (if equipped)
  - Aerial (if equipped)
- Setup
- Clock Setup
- Date & Time
  - 12 or 24 hour format
  - Set time and date
- Backlight
  - Daytime
  - Night time
  - Sensitivity
- Unit Selection
- Home Screen
- Virtual Button Setup
- 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 indicated
    - Driver Side Cab Door
    - Passenger's Side Cab Door
    - Driver Side Crew Cab Door
    - Passenger's Side Crew Cab Door
    - Driver Side Body Doors
    - Passenger's Side Body Doors
    - Rear Body Door(s)
    - Ladder Rack (if applicable)
    - Deck Gun (if applicable)
    - Light Tower (if applicable)
    - Hatch Door (if applicable)
    - Stabilizers (if applicable)
    - Steps (if applicable)

- Notifications
  - View Active Alarms
    - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
    - Silence Alarms - All alarms are silenced

- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
• Ascendant Set Up Confirmation (if equipped)
  Button functions and button labels may change with each screen.

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

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

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

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

**Seat Belt Monitoring System**
A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display and in the center overhead of the cab instrument panel. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

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

The seat belt monitoring screen will become active on the Command Zone color display when:

- The home screen is active:
  - and there is any occupant seated but not buckled or any belt buckled with an occupant.
  - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.
The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists, and the parking brake is released, or the transmission is not in park.

**RADIO ANTENNA MOUNT**

There will be two (2) standard 1.125", 18 thread antenna-mounting base(s) installed on the right side on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the instrument panel area. 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.

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 solenoids 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
- 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 ELECTRICAL SYSTEM DIAGNOSTICS
Advanced on-board diagnostic messages will be provided to support rapid troubleshooting of the electrical power and control system. The diagnostic messages will be displayed on the information center located at the driver’s position.

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

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

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

Prognostics will include:

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

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

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

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.
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.

POWER AND GROUND STUDS
Spare circuits will be provided in the primary distribution center for two-way radio equipment.

The spare circuits will consist of the following:

- One (1) 12-volt DC, 30 amp battery direct spare
- One (1) 12-volt DC ground and un-fused switched battery stud located in or adjacent to
  the power distribution center

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

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

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

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

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

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

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

**ELECTRICAL**

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

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

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

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.
An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

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

**BATTERY SYSTEM**
Six (6) 12 volt, Deka, Model 1231MF, maintenance free group 31 batteries that include the following features, each, will be provided:

- 1000 CCA (cold cranking amps)
- 185 reserve capacity
- High cycle
- Ref. CA of 1190 at 0 degrees Fahrenheit
- 185 reserve capacity
- Threaded studs

**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 placed on non-corrosive mats and stored in well ventilated compartments located under the cab.

Heavy-duty, 2/0 gauge, color coded battery cables will be provided. 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 included on the battery compartments.
**BATTERY CHARGER**

There will be a Kussmaul 1200, Model 091-187-12-Remote, battery charger provided. A Kussmaul, Model 091-194-IND-WT-**, water tight auto charge status center indicating the state of charge will be included. The color of the charge indicator will be yellow.

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

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

Battery charger will be located in the cab behind the driver seat.

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 inle(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

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

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

The shoreline(s) will be connected to the battery charger and body receptacles.

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 Ratting (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side of cab, above wheel.

**GENERATOR TO SHORELINE TRANSFER SWITCH**

There will be an automatic transfer switch between the onboard generator and the shoreline inlet. The loads connected to the transfer switch will be power from the onboard generator when the generator is running.

**ALTERNATOR**

A C.E. Niehoff, model C680-1, alternator will be provided. It will have a rated output current of 430 amp as measured by SAE method J56. It will also have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.
ELECTRONIC LOAD MANAGER
An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

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

The system will include the following features:

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

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

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

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

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

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

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

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

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

**HEADLIGHTS**
There will be four (4) JW Speaker®, Model 8800, 4" x 6" rectangular LED lights 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 black 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.

**INTERMEDIATE LIGHT**
There will be two (2) Weldon, Model 9186-8580-29, amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel. The light will double as a turn signal and marker light.
CAB CLEARANCE/MARKER>ID LIGHTS
There will be five (5) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

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

FRONT CAB SIDE CLEARANCE/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 additional directional lights with the corresponding directional circuit.

REAR CLEARANCE/MARKER>ID LIGHTING
There will be a three (3) LED light bar used as identification lights located at the rear of the apparatus per the following:

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

There will be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

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

There will be two (2) LED lights installed on the side of the apparatus used as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height
There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1)
each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00",
above the ground.

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

Per FMVSS 108 and CMVSS 108 requirements.

**REAR FMVSS LIGHTING**
The rear stop/tail and directional LED lighting will consist of the following:

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

The lights shall be provided with color lenses.

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.

**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®, four (4) place black housings provided for the rear M6 series
stop/tail, directional, back up, scene lights or warning lights.

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

**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.
PUMP HOUSE PERIMETER LIGHTS
There will be two (2) Amdor, Model AY-LB-12HW020, 350 lumens each, 20.00" LED weatherproof strip lights with brackets provided under the pump panel running boards, one (1) each side.

If the combination of options in the vehicle does not permit clearance for a 20.00" light, a 12.00" version of the Amdor light will be installed.

The lights will be controlled by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS
There will be two (2) Amdor, Model AY-LB-12HW020, 350 lumens, 20.00" long, white LED's, 12 volt DC lights provided at the rear step area of the body, one (1) each side shining to the rear.

The perimeter scene lights will be activated when the parking brake is applied.

STEP LIGHTS
Four (4) white LED step lights will be provided. One (1) step light will be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard.

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

These step lights will be actuated with the pump panel light switch.

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

SCENE LIGHTS
There will be one (1) Fire Research, Model SPA900-Q70 scene light(s) with chrome flange(s) installed on the side of the apparatus, passenger side in the crew cab extension.

A control for the light(s) selected above will be the following:

- a switch at the driver's side switch panel
- a switch at the pump operator's panel

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

SCENE LIGHTS
There will be one (1) Fire Research, Model SPA900-Q70 scene light(s) with chrome flange(s) installed on the side of the apparatus, driver's side in the crew cab extension.

A control for the light(s) selected above will be the following:
a switch at the driver's side switch panel

a switch at the pump operator's panel

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

**12 VOLT LIGHTING**
There will be a HiViz Model FT-B-72-**-**, 2.56" high x 72.69" long x 3.31" deep 21,067 effective lumens 12 volt DC light with white LEDs configured with a combination of flood and spot optics mounted, as far forward on the cab roof as practical.

The painted parts of the light housing and brackets to be black.

The light will be activated by a switch at the driver's side switch panel and by a switch at the driver's side pump panel.

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

**HOSE BED LIGHTS**
There will be white 12 volt DC LED light strips with stainless steel protective cover, provided to light the hose bed area. Hose Bed lights will meet the photometric levels listed in NFPA 1901 for Hose Bed lighting requirements.

- Light strip(s) will be installed along the upper edge of the left side of the hose bed.
- Light strip(s) will be installed along the upper edge of the right side of the hose bed.

The lights will be activated by a cup switch at the rear of the apparatus no more than 72.00" from the ground.

**REAR SCENE LIGHTS**
There will be two (2) Fire Research, Model SPA900-Q70, LED scene lights with chrome trim bezels installed at the rear of the apparatus. These lights will be installed between 42.00" and 90.00" above the ground.

The lights will be controlled by a switch at the driver's side switch panel, by a switch at the driver's side pump panel and by a cup switch at the driver's side rear bulkhead.

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

The light(s) will be activated when the body step lights are on.
WATER TANK
Booster tank will have a capacity of 750 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated.

The tank will be stepped in design to allow for a low hosebed.

Tank joints and seams will be nitrogen welded inside and out.

Tank will be baffled in accordance with NFPA Bulletin 1901 requirements.

Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions will interlock and will be welded to the tank bottom and sides.

Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.

Tank top will be sufficiently supported to keep it rigid during fast filling conditions.

Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump that will be sized dependent on the tank to pump plumbing will be provided at the bottom of the water tank.

Sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated cradle assembly constructed of structural steel.

Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of steel bar channel or rectangular tubing.

Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

Stops or other provision will be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system will be approved by the tank manufacturer.
Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

**TANK CRADLE**
The water tank will be installed in a fabricated cradle assembly constructed of stainless steel.

Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of stainless steel bar channel or rectangular tubing.

**WATER TANK RESTRAINT**
A heavy-duty water tank restraint will be provided.

**HOSE BED**
The hose bed will be fabricated of 0.125"-5052 aluminum with a nominal 38,000 psi tensile strength.

The hose bed will be as low as practical.

Upper and rear edges of side panels will have a double break for rigidity.

The upper inside area of the beavertails will be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.

Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats will be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation.

A cross divider will be provided at the front of the hose bed before the tank transitions from the lower section to the upper section. The divider will run from the top of the side sheet down below the hose bed grating.

Hose bed will accommodate 300' of 1.75", 300' or 2.5" with 200' of 1.75" on top, 1500' of 5", 600' of 3" and 600' of 2.5".

**HOSE BED DIVIDER**
Four (4) adjustable hosebed dividers will be furnished for separating hose.

Each divider will be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.
Divider will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.

Divider will be held in place by tightening bolts, at each end.

Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

**HOSE BED HOSE RESTRAINT**

The hose in the hose bed will be restrained by a black nylon Velcro® strap at the top of the hosebed. At the rear of the hose bed, 2.00" black nylon webbing with a 1.50" x 4.00" box pattern will attach at the top rear outside corners with seat belt buckle fasteners. The webbing will have straps connected with seat belt buckle fasteners located at the rear body sheet below the hose bed.

**HOSE BED COVER**

A two (2) section hose bed cover, constructed of .125" bright aluminum treadplate will be furnished. The cover will be hinged with full length stainless steel piano hinge. The sides will be slanted down.

The cover will be reinforced so that it can support the weight of a man walking on the cover.

The cover is designed with the left cover opening first.

If access to the water tank fill tower is blocked by the hose bed cover, then a hinged door will be provided in it so that the tank may be filled without raising cover doors.

Chrome grab handles and four (4) gas filled cylinders will be provided to assist in opening and closing the cover. A handrail is to be provided at the rear, in the center of the support, to assist in opening the cover.

**RUNNING BOARDS**

Running boards will be fabricated of .125" aluminum. The running board assembly will be coated with Safe-Stride® black non-slip surface treatment.

Each running board will be supported by a welded 2.00" square tubing and channel assembly, which will be bolted to the pump compartment substructure.

Running boards will be 12.75" deep and spaced .50" away from the pump panel.

A splash guard will be provided below the running board treadplate.

**TAILBOARD**

The tailboard will also be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The tailboard area will be 16.00" deep.
The exterior side will be flanged down and in for increased rigidity of tailboard structure.

**REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL**
The rear facing surfaces of the center rear wall will be smooth aluminum.

The bulkheads, the surface to the rear of the side body compartments, will be smooth and the same material as the body.

Any inboard facing surfaces below the height of the hosebed will be aluminum diamondplate.

**TOW BAR**
A tow bar will be installed under the tailboard at center of truck.

Tow bar will be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly will be constructed of .38" structural angle. When force is applied to the bar, it will be transmitted to the frame rail.

Tow bar assembly will be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb, or a 20,000 lb straight horizontal pull in line with the centerline of the vehicle.

Tow bar design will have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

**SAFE-STRIDE® COATING - TAILBOARD**
Protective black Safe-Stride® non-slip surface treatment shall be provided on the outside exterior of the top tailboard corner. It shall not be applied on the underside of the flange.

**HOSE TRAY**
Two (2) hose trays will be recessed one (1) in each side running board.

Capacity of the tray will be 20.00' of 5.00" soft suction hose.

Rubber matting will be installed on the floor of the tray to provide proper ventilation.

**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.

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

The side compartment door opening will be framed by flanging the edges in 1.75" and bending out again .75" to form an angle.
Drip protection will be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel.

The top of the compartment will be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers will have the corners welded.

Side compartment covers will be separate from the compartment tops.

Front facing compartment walls will be covered with bright aluminum treadplate.

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

**UNDERBODY SUPPORT SYSTEM**
Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.

The support system will include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

Attached to the bottom of the steel vertical angles will be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.

A steel frame will be mounted on the top of these supports to create a floating substructure which will result in a 500 lb equipment support rating per lower compartment.

The floating substructure will be separated from the horizontal members with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body.

Isolators will have a broad load range, proven viability in vehicular applications, be of a fail safe design and allow for all necessary movement in three (3) transitional and rotational modes.

The neoprene isolators will be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.

**AGGRESSIVE WALKING SURFACE**
All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.
LOUVERS
Louvers will be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they will be formed into the metal and not added to the compartment as a separate plate.

TESTING OF BODY DESIGN
Body structural analysis has been fully tested. Proven engineering and test techniques such as finite element analysis, stress coating and strain gauging have been performed with special attention given to fatigue, life and structural integrity of the cab, body and substructure.

Body will be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure will include:

- Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.
- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.
- Driving the vehicle at 35 mph on a washboard road.
- Driving the vehicle at 55 mph on a smooth road.
- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

Evidence of actual testing techniques will be made available upon request.

ENGINEER COMPARTMENT
A transverse engineer compartment will be provided ahead of the water pump.

Compartment will be 22.00" wide x 38.00" high x 92.00" deep. The door opening will be 20.50" wide x 36.25" high. The clear height of the transverse section over the chassis frame rails will be 14.00" high.

Compartment will be furnished with vertically hinged, lap style, compartment doors that have a "D" handle latch and positive door hold open device.

A section of the back wall of each compartment will be removable for access to the fire pump.

LEFT SIDE COMPARTMENTATION
The left side compartmentation will consist of three lap door compartments.

A full height, vertically hinged, single door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 28.63" wide x 61.88" high.
A horizontally hinged, single lift-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening will be a minimum of 59.25" wide x 27.00" high.

A full height, vertically hinged, double door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.75" wide x 67.63" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 43.50" wide x 62.88" high.

The interior height of the compartments will be measured from the compartment floor to the ceiling. The depth of the compartments will be measured from the back wall to the inside of the door frame.

Closing of the doors will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

The vertically hinged doors will be furnished with a positive door holder.

The lift-up door will be furnished with two gas-charged cylinders to assist in the opening of the door and to maintain the door in an open position. There will be a field adjustable, three-position bracket mounted on the vertical side door opening that will allow the door to be held open at 87°, 90°, or 93°.

**RIGHT SIDE COMPARTMENTATION**
The right side compartmentation will consist of three lap door compartments.

A full height, vertically hinged, single door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 28.63" wide x 61.88" high.

A horizontally hinged, single lift-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening will be a minimum of 59.25" wide x 27.00" high.

A full height, vertically hinged, double door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.75" wide x 67.63" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 43.50" wide x 62.88" high.

The interior height of the compartments will be measured from the compartment floor to the ceiling. The depth of the compartments will be measured from the back wall to the inside of the door frame.
Closing of the doors will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

The vertically hinged doors will be furnished with a positive door holder.

The lift-up door will be furnished with two gas-charged cylinders to assist in the opening of the door and to maintain the door in an open position. There will be a field adjustable, three-position bracket mounted on the vertical side door opening that will allow the door to be held open at 87°, 90°, or 93°.

**SIDE COMPARTMENT DOORS**
All hinged compartment doors will be lap style with double panel construction and 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.

All door locking 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 FMVSS approved door locking mechanisms.

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.

**REAR COMPARTMENTATION**
A roll-up door compartment above the rear tailboard will be provided.

The interior dimensions of this compartment will be 40.00" wide x 33.63" high x 25.88" deep. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartment will be calculated with the compartment door closed.

A louvered, removable access panel will be furnished on the back wall of the compartment.

The rear compartment will be open into the rear side compartments.

The clear door opening of this compartment will be a minimum of 33.25" wide x 23.88" high.
Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

ROLLUP REAR COMPARTMENT DOOR
There will be a rear rollup door. The door will be double faced aluminum construction, an anodized satin finish and manufactured by Gortite®.

Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from 180 to -40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from 300 to -40 degrees Fahrenheit.

A polished stainless steel lift bar to be provided for each roll-up door. Lift bar will be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Door will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surface will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

The header for the rollup door assembly will not exceed 4.00".

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

DOOR GUARD
There will be seven (7) compartment doors that will include a guard/drip pan designed to protect the rollup door from damage when in the retracted position and contain any water spray. The guard will be fabricated from stainless steel and installed left side rearward compartment, left side over the wheel compartment, left side forward compartment, right side rearward compartment, right side over the wheel compartment, right side forward compartment and rear compartment.

DOOR PULL STRAPS
There will be two (2) compartment doors provided with 18.00" elastic pull straps secured to the mid-length of the side compartment with a footman loop and the rear of the roll-up door RS2 and LS2.
REVERSE HINGED DOOR
The two (2) compartment doors, located RS3 and LS3, will have the hinge at the rear of the door.

COMPARTMENT LIGHTING
There will be nine (9) 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 all body compartment(s).

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.

HATCH COMPARTMENT LIGHTING IPOS
There will be two (2) Pierce 40.00" white 12 volt DC LED compartment light strip(s) installed in place of the rubber mounted lights in the hatch compartment(s) located right side.

One (1) hatch compartment on the left side will have a vertically hinged single panel, smooth aluminum door located at the rear. The door(s) will be provided with D-handle latch and be hinged along the outboard edge.

HATCH COMPARTMENT
One (1) hatch compartment 151.75" long x 13.75" wide x 22.00" maximum depth will be provided above the right side compartments, with two (2) liftup top opening hatch doors.

Compartment will extend the full length of the side body compartmentation.

Sides of the compartment will be constructed of the same material as the body and painted job color. A chrome and black vinyl molding will be provided to cover the seam between the top of the body panel and the bottom of the hatch compartment.

Top of the compartment will be constructed of bright aluminum treadplate.

Two (2) liftup, bright aluminum treadplate doors will be provided on the top of the compartment, each with a chrome grab handle.

Doors will have lipped edges with a rubber seal for weather resistance, and an inner pan with one (1) recessed light.

Doors will be hinged on the outboard side and will be held open with rubber covered chains.

One (1) socket and plunger type latch will be provided with each door to hold the doors in the closed position.

Each door will have a clear door opening of 64.00" long x 7.50" wide.
Compartment will drain to an area below the hose bed.

**HATCH COMPARTMENT**
One (1) hatch compartment 151.75 long x 13.75 wide x 22.00" maximum depth will be provided above the left side compartments.

Compartment will extend the full length of the side body compartmentation.

Sides of the compartment will be constructed of the same material as the body and painted job color. A 1.00" tall painted aluminum extrusion will be provided to cover the seam between the top of the body panel and the bottom of the hatch compartment. The vertical outboard seam at the center of the compartment will be smooth weld finished and painted.

Top of the compartment will be constructed of bright aluminum treadplate.

Compartment will drain to an area below the hosebed.

**MOUNTING TRACKS**
There will be seven (7) sets of tracks for mounting shelf(s) in LS1, LS2, LS3, RS1, RS2, RS3 and B1. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

**ADJUSTABLE SHELVES**
There will be eight (8) shelves with a capacity of 500 lb provided.

The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

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

The location(s) will be determined at a later date.

**SLIDE-OUT FLOOR MOUNTED TRAY**
There will be four (4) floor mounted slide-out tray(s) provided.

Each tray will have 2.00" high sides and a minimum capacity rating of 500 lb in the extended position.

Each tray will be constructed of aluminum painted spatter gray

There will be two undermount-roller bearing type slides rated at 250lb each provided. The pair of slides will have a safety factor rating of 2.

To ensure years of dependable service, the slides will be coated with a finish that is tested to withstand a minimum of 1,000 hours of salt spray per ASTM B117.
To ensure years of easy operation, the slides will require no more than a 50lb force for push-in or pull-out movement when fully loaded after having been subjected to a 40 hour vibration (shaker) test under full load. The vibration drive file will have been generated from accelerometer data collected from a heavy truck chassis driven over rough gravel roads in an unloaded condition. Proof of compliance will be provided upon request.

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.

The location(s) will be RS1, RS3, LS1 and LS3.

**DRAWER ASSEMBLY**
A slideout drawer assembly will be installed in LS3.

The clear dimensions starting at the top of the cabinet with the first drawer will be 3.25" with a face plate that is 4.00" high x 21.00" deep. The clear dimensions of the second drawer will be 3.75" with a face plate that is 4.00" high x 21.00" deep. The clear dimensions of the third drawer will be 4.75" with a face plate that is 5.00" high x 21.00" deep. The clear dimensions of the fourth drawer will be 4.75" with a face plate that is 5.00" high x 21.00" deep. Each drawer will be the same width and not exceed 24.00".

The drawers will have a capacity of 250 pounds.

The drawers will be mounted in a cabinet housing constructed of light gray powder coated aluminum with anodized aluminum frames. The housing will be 24.00" deep, and completely enclose the drawer.

A full-length aluminum extruded rail will be provided at the top edge of each drawer. This rail will act as the latching mechanism as well as the handle for each drawer.

There will be a total of one (1) provided.

**RUB RAILS**
The bottom edge of the side body compartments will be trimmed with a black 1.00" thick x 2 5/8" high plastic poly "UPF" rub rail. There will be .50" rubber spacers included between the rub rail and the body.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

**BODY FENDER CROWNS**
Painted stainless steel fender crowns will be provided around the rear wheel openings with a dielectric barrier will be provided between the fender crown and the fender sheet metal to prevent corrosion. The crown will be painted #101 black.
The fender crowns will be held in place with stainless steel screws that thread directly into a composite nut and not directly into the parent body sheet metal to eliminate dissimilar metals contact and greatly reduce the chance for corrosion. Rubber welting will be provided between the body and crown.

**BODY FENDER LINER**
A painted fender liner will be provided. The liners will be removable to aid in the maintenance of rear suspension components.

**HARD SUCTION HOSE**
Two (2) lengths of 6.00" Kochek Fire Grade clear corrugated hard suction hose, reinforced with a black spiral helix, 10' in length, will be provided. The hose will be equipped with a long handle female coupling on one (1) end and a rocker lug male coupling on the other end. Couplings will be black anodized hard coated aluminum.

**HOSE TROUGHS**
Two (2) stainless steel hard suction hose troughs will be provided.

The troughs will be located on the left side of the apparatus, inside the hatch compartments, stacked vertically.

**HANDRAILS**
The handrails will be 1.25" diameter black anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

E-coated and black powder coated stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

Handrails will be provided to meet NFPA 1901 section 15.8 requirements. The handrails will be installed as noted on the sales drawing.

**HANDRAILS**
One (1) vertical handrail will be located on each rear beavertail. The handrails will be 1.25" diameter black anodized aluminum extrusion. The handrail will have e-coated and black powdered coated stanchions.

One (1) horizontal black rubber-covered handrail will be provided above the hose bed at the rear of the apparatus. The hose bed dividers shall be tied to the upper handrail or cross bar in order to provide sufficient reinforcement.

**AIR BOTTLE STORAGE (TRIPLE)**
A quantity of three (3) air bottle compartments designed to hold (3) air bottles up to 7.25" in diameter x 26.00" deep will be provided on the left side forward of the rear wheels, on the right
side forward of the rear wheels and on the right side rearward of the rear wheels. A painted stainless steel door with a Southco raised trigger C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

**AIR BOTTLE COMPARTMENT STRAP**
A strap will be provided in the air bottle compartment(s) to help contain the air bottles when the vehicle is parked on an incline. The strap will wrap around the neck and attach to the wall of the compartment.

**AIR BOTTLE STORAGE (SINGLE)**
A quantity of one air bottle compartment, approximately 7.50" wide x 7.50" tall x 26.00" deep, will be provided on the driver side rearward of the rear wheels. The triangular door will cover the air bottle opening, the DEF tank access, and fuel fill. The compartment will be square with angled corners. A painted stainless steel door with a Southco raised trigger C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

**AIR BOTTLE COMPARTMENT STRAP**
A strap will be provided in the air bottle compartment to help contain the air bottle when the vehicle is parked on an incline. The strap will wrap around the neck and attach to the wall of the compartment.

**EXTENSION LADDER**
There will be a 24' two-section aluminum Duo-Safety Series 900-A extension ladder provided.

**ROOF LADDER**
There will be a 14' aluminum Duo-Safety Series 775-A roof ladder provided.

**HYDRAULIC LADDER RACK**
Ground ladders will be mounted above the right side of the hose body in a specially designed swing-down cradle. This cradle will be electric/hydraulic operated. The system design will have been life cycle tested for at least 14 years of dependable service.

An independent hydraulic pump powered by a 12-volt electric motor will operate the hydraulics. The hydraulic pump and reservoir will be accessible from the ground through a stainless steel inspection door.

The ladder rack will incorporate two hydraulic rotary actuators, one each located inside the front compartment and the rear compartment. The actuators will be completely enclosed within each
compartment to eliminate any pinch points while operating the ladder rack. Lifting arms will be attached outside the compartment body to the front and rear actuator.

The rack can be designed in certain situations to provide lifting capabilities up to 500 lb.

The maximum height of the rack from the ground in the lowered position will be no more than 47.00".

The electric control panel will have a master switch on/off switch, an actuation switch, an operation indicator light and operation instructions. The electric controls will be located in such a manner to allow the operator full view of the area into which the ladders will be lowered.

Two (2) safety locks will be furnished to securely maintain the ladder rack assembly in the travel position. For ease of use, the safety locks will be located above the front and rear bulkheads and be operational while standing on the ground.

Ladders will be secured to the brackets with two (2) locks retaining the roof ladder and the extension ladder. The locks will be such that when the roof ladder is removed, the clamps can be moved a half turn to hold the extension ladder in place.

**Ladder Rack Interlock and Not Stowed Indicator Light**
An interlock will be provided to prevent operation of the ladder rack unless the apparatus parking brake has been activated.

A steady red indicator light will be located on the cab instrument panel and illuminated when the hydraulic ladder rack is not in the stowed position. The light will be labeled "Ladder Rack". In addition, the "Do Not Move Apparatus" light located in the cab will be activated when the hydraulic ladder rack is not in the stowed position.

**Hydraulic Ladder Rack Deployed Lights**
There will be two (2) Truck-Lite catalog number 15***, 1.20" high x 2.49" wide x 0.94" deep lights with black trim, red flashing LEDs and, provided per the following:

- One (1) light installed on the front of the hydraulic ladder rack
- One (1) light installed on the rear of the hydraulic ladder rack
- The warning light lens colors to be the same as the LEDs

The lights will be activated when the battery switch is on and the hydraulic ladder rack is not in the stowed position.

**Folding Ladder**
One (1) 10.00' aluminum, Series 585-A, Duo-Safety folding ladder will be installed on the inboard side of the hydraulic ladder rack.
HYDRAULIC LADDER RACK PUMP LOCATION
The hydraulic pump for the ladder rack will be located right side pump house. An access door will be provided to fill the pump.

PIKE POLE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) 8 ft or longer pike pole mounted in a bracket fastened to the apparatus.

The pike pole is not on the apparatus as manufactured. The fire department will provide and mount the pike pole.

The pike pole(s) will be a Duo-Safety 10' pike pole.

6' PIKE POLE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) 6' pike pole or plaster hook mounted in a bracket fastened to the apparatus.

The pike pole is not on the apparatus as manufactured. The fire department will provide and mount the pike pole.

The pike pole(s) will be a Duo-Safety 6' pike pole.

PIKE POLE STORAGE
Aluminum tubing will be used for the storage of two (2) pike poles and will be located on hydraulic ladder rack. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

PIKE POLE STORAGE
PVC tubing will be used for the storage of two (2) pike poles and will be located in the transverse area of the auxiliary crew cab compartment. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

FOLDING STEPS FRONT OF BODY
Folding steps will be provided full height on the left side body compartments to provide access to the cargo bed. The quantity installed as noted on the sales drawing.

The Trident steps will be bright finished, non-skid with a black coating.

The step will incorporate an LED light to illuminate the stepping surface.

The steps can be used as a hand hold with two openings wide enough for a gloved hand.
REAR FOLDING STEPS
Bright finished, non-skid folding steps with a black coating will be provided at the rear. Each step will incorporate an LED light to illuminate the stepping surface. The steps can be used as a hand hold with two openings wide enough for a gloved hand.

PUMP
Pump will be a Waterous CSU, 2000 gpm single (1) stage midship mounted centrifugal type.

Pump will be the class "A" type.

Pump will deliver the percentage of rated discharge at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.
-70% of rated capacity at 200 psi net pump pressure.
-50% of rated capacity at 250 psi net pump pressure.

Pump body will be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

Pump will be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

Pump case halves will be bolted together on a single horizontal face to minimize a chance of leakage and facilitate ease of reassembly. No end flanges will be used.

Discharge manifold of the pump will be cast as an integral part of the pump body assembly and will provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.

The three (3) 3.50" openings will be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

Impeller shaft will be stainless steel, accurately ground to size. It will be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller will have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.

Bearings will be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings will be used.

PUMP PACKING
Stuffing boxes will be of the conventional two (2) piece, split-gland type, to permit adjustment or replacement of Grafoil packing without disturbing the pump. Water will be fed into stuffing box lantern rings for proper lubrication and cooling when the pump is operating.
Lantern rings will be located at the inner ends of the stuffing boxes, to avoid having to remove them when replacing pump packing.

Wear rings will be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

**PUMP TRANSMISSION**
The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength Morse HY-VO silent drive chain. By the use of a chain rather than gears, 50% of the sprocket will be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work.

Drive shafts will be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case will be designed to eliminate the need for water cooling.

**PUMPING MODE**
An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system will be designed to allow stationary pumping only.

**AIR PUMP SHIFT**
Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control will also be located on the left side pump panel.

Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump".

Another green indicator light will be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light will be labeled "Warning: Do not open throttle unless light is on".

The pump shift will be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements.

The pump shift control in the cab will be illuminated to meet NFPA requirements.

**TRANSMISSION LOCK-UP**
The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control in the cab is activated.
AUXILIARY COOLING SYSTEM
A supplementary heat exchange cooling system will be provided to allow the use of water from
the discharge side of the pump for cooling the engine water. The heat exchanger will be
cylindrical type and will be a separate unit. The heat exchanger will be installed in the pump or
engine compartment with the control located on the pump operator's control panel. Exchanger
will be plumbed to the master drain valve.

INTAKE RELIEF VALVE - PUMP
There will be One (1) Elkhart Style 40 relief valve(s) installed on the suction side of the pump
preset at 125 psig.

The relief valve(s) will have a working range of 75 psi to 250 psi.

The outlet will terminate below the frame rails with a 2.50" National Standard hose thread
adapter and will have a "do not cap" warning tag.

The relief valve pressure control will be located behind behind the right side pump panel with a
stainless steel access door.

PRESSURE CONTROLLER
A Fire Research Pump Boss Model PBA400 pressure governor will be provided.

A pressure transducer will be installed in the water discharge manifold on the pump.

A pressure transducer will be installed in the inlet manifold on the pump

The display panel will be located at the pump operator's panel.

PRIMING PUMP
The priming pump will be a Trident Emergency Products compressed air powered, high
efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the
current edition of NFPA 1901.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control will open the priming valve and start the pump primer.

PUMP MANUALS
There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished
with the apparatus. The manuals will be provided by the pump manufacturer in the form of two
(2) electronic copies. Each manual will cover pump operation, maintenance, and parts.
PLUMBING, STAINLESS STEEL AND HOSE
All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose’s will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

Plumbing manifold bodies will be ductile cast iron or stainless steel.

All piping lines are to be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame.

All water carrying gauge lines will be of flexible polypropylene tubing.

All piping, hose and fittings will have a minimum of a 500 PSI hydrodynamic pressure rating.

MAIN PUMP INLETS
A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

MAIN PUMP INLET CAP
The main pump inlets will have National Standard Threads with a long handle chrome cap.

The cap will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

VALVES
All ball valves will be Akron® Brass. The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves will have a ten (10) year warranty.

LEFT SIDE INLET
There will be one (1) auxiliary inlet with a 3.00" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.
RIGHT SIDE INLET
There will be one (1) auxiliary inlet with a 3.00" valve at the right side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

The location of the valve for the two (2) inlets will be recessed behind the pump panel.

ANODE, INLET
A pair of replaceable sacrificial .75" magnesium anodes will be provided in the water pump to protect the pump from corrosion. One (1) will be placed in the inlet side of the pump and the other in the discharge side of the pump.

INLET CONTROL
The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism will indicate the position of the valve.

INLET BLEEDER VALVE
A 0.75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeder's will be routed below the chassis frame rails.

TANK TO PUMP
The booster tank will be connected to the intake side of the pump with stainless steel piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator’s panel. Tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL
A 2.00" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

LEFT SIDE DISCHARGE OUTLETS
There will be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.
RIGHT SIDE DISCHARGE OUTLETS
There will be two (2) discharge outlets with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

LARGE DIAMETER DISCHARGE OUTLET
There will be a 5.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with a 5.00" (M) National Standard hose thread adapter. This discharge outlet will be actuated with a handwheel control at the pump operator's control panel.

An indicator will be provided to show when the valve is in the closed position.

FRONT DISCHARGE OUTLET
There will be one (1) 2.50" discharge outlet piped to the front of the apparatus and located on the top of the left side of the front bumper.

Plumbing will consist of 2.50" piping and flexible hose with a 2.50" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 2.50" NST with 90 degree stainless steel swivel.

There will be Trident swing handle drains provided at all low points of the piping.

ADDITIONAL FRONT DISCHARGE OUTLET
There will be one (1) 2.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper.

Plumbing will consist of 2.50" piping and flexible hose with a 2.50" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 2.50" NST with 90 degree stainless steel swivel.

There will be Trident swing handle drains provided at all low points of the piping.

REAR DISCHARGE OUTLET
There will be four (4) discharge outlets piped to the rear of the hose bed, on two (2) on the left side and two (2) on the right side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing will consist of 3.00" piping along with a 3.00" full flow ball valve with the control from the pump operator panel. The four (4) discharge outlets will terminate with a 2.50" male National Standard hose thread adapter.

DISCHARGE CAPS/INLET PLUGS
Chrome plated, rocker lug, caps with chain will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.
Chrome plated, rocker lug, plugs with chain will be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).

**OUTLET BLEEDER VALVE**
A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

**LEFT SIDE OUTLET ELBOWS**
The 2.50" discharge outlets located on the left side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

**RIGHT SIDE OUTLET ELBOWS**
The 2.50" discharge outlets located on the right side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

**REAR OUTLET ELBOWS**
The 2.50" discharge outlets located at the rear of the apparatus will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.
LARGE DIAMETER OUTLET ELBOWS
The 5.00" outlet will be furnished with a 5.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

DISCHARGE OUTLET CONTROLS
The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve.

If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

DELUGE RISER
A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be rigidly braced and installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel.

MONITOR
An Akron Model 3423 monitor will be properly installed on the deluge riser. This monitor will include a fixed mounting base.

The monitor will be painted to match the body.

NOZZLE, DELUGE
Akron model 5160 Akromatic manual pattern, control fog nozzle will be provided. The nozzle will be rated for 250 to 1250 gallons per minute of flow.

Also included is an Akron model 2499 quad stacked pyrolite, deluge tips and an Akron 3488 pyrolite stream shaper.

The tip sizes will be 1.375", 1.50", 1.75", and 2.00".

The deluge riser will have male National Pipe Threads for mounting the monitor.

CROSSLAY HOSE BEDS
Two (2) crosslays with 1.50" outlets will be provided. Each bed to be capable of carrying 200' of 1.75" double jacketed hose and will be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve.

Outlets to be equipped with a 1.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls will be at the pump operator's panel.
The center crosslay dividers will be fabricated of 0.25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish.

Vertical scuffplates constructed of stainless steel will be provided at the front and rear ends of the bed on each side of vehicle.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

**2.50" CROSSLAY HOSE BED**

One (1) crosslay with 2.50" outlets will be provided. This bed to be capable of carrying 200' of 2.50" double jacketed hose and will be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

Outlet to be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay control will be at the pump operator's panel.

The center crosslay dividers will be fabricated of 0.25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish. The remainder of the crosslay bed will be painted job color.

Stainless steel vertical scuffplates will be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) will also be equipped with a stainless steel scuffplate.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

**CROSSLAY HOSE RESTRAINT**

A 2.00" black nylon webbing design restraint will be provided across the ends of three (3) crosslay(s) to secure the hose during travel. The webbing assembly is to be attached at the bottom of the crosslays with footman loops as a permanent attachment and is attached at the top outside corners with two (2) seat belt buckles. The female end is permanently attached above the crosslay(s) and the male end attached to the webbing.

A 1.00" orange release strap will be provided for each seat belt buckle in order to help facilitate the release of the buckle from the ground.

**BOOSTER HOSE REEL**

A Hannay electric rewind booster hose reel will be installed over the pump in a recessed open compartment on the right side of the apparatus. The reel will be fabricated of aluminum and have highly polished end discs.

A polished stainless steel roller and guide assembly will be mounted on the reel side of the apparatus.
Discharge control will be provided at the pump operator's panel. Plumbing to the reel will consist of 1.50" Aeroquip hose and a 1.50" valve.

Reel motor will be protected from overload with a circuit breaker rated to match the motor.

An electric rewind control switch will be installed on the reel side pump panel.

Booster hose, 1.00" diameter and 200 feet, with chrome plated Barway, or equal couplings will be provided.

Working pressure of the booster hose will be a minimum of 800 psi.

Capacity of the hose reel will be 200 feet of 1.00" booster hose.

**FOAM SYSTEM**
A foam system will not be required on this apparatus.

**PUMP COMPARTMENT**
The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. It will be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment will be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels will be removable from the chassis in a single assembly.

**PUMP MOUNTING**
Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

**LEFT SIDE PUMP CONTROL PANELS**
All pump controls and gauges will be located at the left side of the apparatus and properly identified.

Layout of the pump control panel will be ergonomically efficient and systematically organized.

The pump operator's control panel will be removable in two (2) main sections for ease of maintenance:

The upper section will contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels will be removable from the face of the pump panel for ease of maintenance. Below the sub panels will be located all valve controls and line pressure gauges.
The lower section of the panel will contain all inlets, outlets, and drains.

All push/pull valve controls will have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods will be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls will be capable of locking in any position. The control rods will pull straight out of the panel and will be equipped with universal joints to eliminate binding.

**IDENTIFICATION TAGS**
The identification tag for each valve control will be recessed in the face of the tee handle.

All discharge outlets will have color coded identification tags, with each discharge having its own unique color. Color coding will include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges will be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting will be removable from the face of the pump panel for ease of maintenance. The casting will be color coded to correspond with the discharge identification tag.

All remaining identification tags will be mounted on the pump panel in chrome plated bezels.

The pump panel on the right side will be removable with lift and turn type fasteners.

Trim rings will be installed around all inlets and outlets.

The trim rings for the side discharge outlets will be color coded and labeled to correspond with the discharge identification tag.

**PUMP PANEL CONFIGURATION**
The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

**PUMP AND GAUGE PANEL**
The pump and gauge panels will be constructed of aluminum with a black Line-X spray-on polyurethane/polyurea material finish. A polished aluminum trim molding will be provided around each panel.

The right side pump panel will be removable and fastened with swell type fasteners.
PUMP COMPARTMENT LIGHT
There will be one (1) Whelen®, Model 3SC0CDCR, 3.00" white 12 volt DC LED light(s) with Whelen, Model 3FLANGEC, flange(s) installed in the pump compartment.

There will be a switch accessible through a door on the pump panel included with this installation.

Engine monitoring graduated LED indicators will be incorporated with the pressure controller.

Also provided at the pump panel will be the following:

- Master Pump Drain Control

OK TO PUMP INDICATOR LIGHT
There will be a green indicator light installed on the pump operators panel that is activated when the pump is in Ok To Pump mode.

VACUUM AND PRESSURE GAUGES
The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated ©.

The gauges will be a minimum of 6.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and polished stainless steel plugs. They will be marked with a label.

PRESSURE GAUGES
The individual "line" pressure gauges for the discharges will be Class 1© interlube filled.

They will be a minimum of 2.00" in diameter and have white faces with black lettering.

Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

Gauges will have a pressure range of 30"-0-400#.

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

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.
WATER LEVEL GAUGE
A Fire Research TankVision Pro model WLA300-A00 water tank indicator gauge will be installed on the pump operators panel. The gauge kit will include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The gauge will show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs will provide for a viewing angle of 180 degrees. The gauge case will be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features will be accessed from the front of the indicator module. The program will support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a data link to connect remote indicators. Low water warnings will include flashing LEDs at 1/4 tank and down chasing LEDs when the tank is almost empty.

The gauge will receive an input signal from an electronic pressure sensor. The sensor will be mounted from the outside of the water tank near the bottom. No probe will be placed on the interior of the tank. Wiring will be weather resistant and have automotive type plug-in connectors.

STEP/LIGHT SHIELD
There will be an aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the pump operators panel.

- There will be four (4) Fire Research Firefly, part number LED115-Q01, 12 volt DC LED lights installed under the step to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.
- One (1) pump panel light will come on when the pump is in ok to pump mode.

There will be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel.

There will be one (1) white LED step light provided above this step. In order to ensure exceptional illumination, each step 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 step light will be activated by the pump panel light switch.
ADDITIONAL LIGHT SHIELD
An additional polished, 16 gauge stainless steel light shield will be provided above passenger's side pump panel.

- There will be four (4) Fire Research Firefly, Model 115-Q01, white LED lights installed under the light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. The lights will be operated from a switch on the pump panel. Additional lights will be included every 18.00" depending on the size of the pump house.

AIR HORN SYSTEM
There will be two (2) Grover air horns recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

Air Horn Location
The air horns will be located on each side of the bumper, inside of the frame rails.

AIR HORN CONTROL
The air horns will be actuated by two (2) lanyard rope pull controls, one (1) within reach of the driver and one (1) within reach of the officer. The air horns will also be actuated by 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.

ELECTRONIC SIREN
A Whelen®, Model 295SLSA1, electronic siren with noise canceling microphone will be provided.

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

Electronic siren head will be recessed in the driver side center switch panel.

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) Whelen, Model SA315P, black nylon composite, 100-watt, speaker with through bumper mounting brackets and painted grille provided. The speaker will be connected to the siren amplifier.

The speaker will be recessed in the left side of the front bumper, just outside of the frame rail.
MECHANICAL SIREN
There shall be a Federal Q2B siren furnished with a black painted front grill and side screening.

There shall be a siren brake button installed on the switch panel.

The control solenoid shall be powered up after the emergency master switch is activated.

The mechanical siren will be recessed in the front bumper in the center. The siren will be properly supported using the bumper framework.

The mechanical siren will be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

FRONT ZONE UPPER WARNING LIGHTS
There will be one (1) 81.00” Whelen® Freedom IV™ lightbar mounted on the cab roof.

The lightbar will include the following:

- One (1) red flashing LED module in the left side end position.
- One (1) red flashing LED module in the left side front corner position.
- One (1) blue flashing LED module in the left side first front position.
- One (1) blue flashing 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 LED module in the left side fourth front position.
- One (1) white flashing LED module in the left side fifth front position.
- One (1) blue flashing LED module in the left side sixth front position.
- Open in the left side seventh front position.
- Open in the right side seventh front position.
- One (1) blue flashing LED module in the right side sixth front position.
- One (1) white flashing LED module in the right side fifth front position.
- One (1) red flashing LED module in the right side fourth front position.
- One (1) red flashing LED module in the right side third front position.
- One (1) blue flashing LED module in the right side second front position.
- One (1) blue flashing LED module in the right side first front position.
- One (1) red flashing LED module in the right side front corner position.
- One (1) red flashing LED module in the right side end position.

There will be clear lenses included on the lightbar.

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

The five (5) red and five (5) blue flashing LED modules in the front positions may be load managed when the parking brake is applied.
The white LEDs will be deactivated when the parking brake is applied.

**SIDEWARNING LIGHTS**
There will be two (2) 21.50" Whelen Freedom IV LED lightbars mounted on the roof, one (1) on each side, over the cab doors.

Each lightbar will include the following:

- One (1) red flashing LED module in the outside front corner position.
- One (1) blue flashing LED module in the front outside position.
- One (1) red flashing LED module in the rear outside position.
- One (1) blue flashing LED module in the outside rear corner position.

There will be clear lenses included on the lightbar.

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

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

**FRONT ZONE LOWER LIGHTS**
There will be two (2) pair of Whelen, Model M6**, LED lights installed on the cab face above the headlights, in a common bezel matching the one for the headlamps.

- The driver's side front outside warning light to be red
- The driver's side front inside warning light to be blue
- The passenger's side front inside warning light to be blue
- The passenger's side front outside warning light to be red
- The color of the lenses will be clear

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

**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*C, flashing LED warning lights with chrome trim installed per the following:

- Two (2) lights, one (1) each side on the bumper extension. The side front lights to be red.
• Two (2) lights, one (1) each side above the front wheels. The side middle lights to be blue.
• Two (2) lights, one (1) each side above rear wheels. The side rear lights to be red.
• The lights will include clear lenses.
There will be a switch in the cab on the switch panel to control the lights.

SIDE WARNING LIGHTS
There will be two (2) Whelen, Model M9*C LED flashing warning light(s) with bezel(s) provided one (1) each side, high and forward, on the hatch compartment sides.

The color of the lights will be blue.

All of these lights will include a clear lens.

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

REAR ZONE LOWER LIGHTING
There shall be two (2) Whelen®, Model M6*C, LED flashing warning lights located at the rear of the apparatus.

• The driver's side rear light to be red
• The passenger's side rear light to be blue
Both lights will include a lens that is clear.

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

WARNING LIGHTS (REAR AND SIDE UPPER ZONES)
Four (4) Whelen, model M9*C LED flashing warning lights will be provided at the rear of the apparatus.

The side rear upper light(s) on the driver's side to be red.

The rear upper light(s) on the driver's side to be blue.

The rear upper light(s) on the passenger's side to be red.

The side rear upper light(s) on the passenger's side to be red.

These lights will include a lens that is clear.

There will be a switch located in the cab on the switch panel to control the lights.
TRAFFIC DIRECTING LIGHT
There will be one (1) Whelen®, Model TAL65, 36.00" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen, Model TACTL5, control head will be included with this installation.

The controller will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be recessed at the rear of the apparatus as high as practical.

The traffic directing light control head will be located in the driver side overhead switch panel in the right panel position.

ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT
The following guidelines will apply to the 120/240 VAC system installation:

General
Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

Grounding
Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.

An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This
conductor will have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.

All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

**Operation**

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.

Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the following information:

- Rated voltage(s) and type (ac or dc)
- Phase
- Rated frequency
- Rated amperage
- Continuous rated watts
- Power source engine speed

Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.

**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 degF 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 SE0 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.

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.

GENERATOR
The apparatus will be equipped with a complete electrical power system. The generator will be a Harrison Model 10.0MPC-16 10.0 kW Hydraulic unit. 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 @ 120 volts, 41.7 @ 240 volts
- Phase: Single
- Cycles: 60 hertz
- Engine Speed at Engagement: Idle
- RPM range: 1100 to 3,000

**Generator Dimensions**

- Length: 35 inches
- Width: 23 inches
- Height: 19.00 inches
- Weight: 475 pounds

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 a 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.

**Generator Instruments and Controls**

To properly monitor the generator performance a meter panel will be furnished and mounted next to the circuit breaker panel. The unit will be a single phase, three (3)-wire, 120/240-volt series. The following instruments will be installed in the panel if not specified on the generator:

- One (1) Voltmeter
- Two (2) Ammeters
- One (1) Frequency Meter
- One (1) Hour Meter on the Generator
- One (1) "PTO" Engagement Green Indicator Light

- One (1) "Power On" Green Indicator Light

- Two (2) Fuse Holders with Two (2) Amp Fuses (for gauge protection)

The gauges and controls 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. The load center will have a circuit breaker to assure overload protection. The breaker furnished will be properly sized to the generator output.

**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 in the area over the pump on the left side. 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**

A switch will be located on the cab instrument panel and at the pump panel area to engage the generator. The single switch in both locations will engage the generator PTO and the electric field simultaneously.
GENERATOR REMOTE START
There will be one (1) remote start switch provided in the cab switch panel and on the pump 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
The circuit breaker panel will be located high on the back wall of compartment LS3.

120 VOLT LIGHTING
There will be Two (2) Fire Research Spectra, Model SPA260-K15, 120 AC volt LED surface mounted scene light(s) with black bezel(s) provided and located passenger's side, inside of the M9 warning lights.

The light(s) selected above will be controlled by the circuit breaker included in the AC breaker panel as well as following:

- a switch at the driver's side switch panel
- a switch at the pump operator's panel

120 VOLT LIGHTING
There will be two (2) Fire Research Spectra, Model SPA260-K20, 20,000 lumens 120 volt AC LED surface mounted scene light(s) with black bezel(s) provided driver's side, inside of the M9 warning lights.

The light(s) selected above will be controlled by the circuit breaker included in the AC breaker panel as well as following:

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

ELECTRIC CORD REEL
Furnished with the 120 volt AC electrical system will be an Akron ERWC-10-16 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 inches above the operators standing position.

The reel will be capable holding 12/3 600 volt cable or 10/3 600 volt cable.

The reel will include the following features:

- Heavy-duty construction for durability
- All stainless steel hardware
- Rolled disc edges
- Live slip ring design
• Includes the gang box attached to the commutator.
• Meets NFPA requirements for reel overage of 10%

The exterior finish of the reel(s) will be powder coated silver from the reel manufacturer.

A Nylatron guide to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length.

A total of one (1) cord reel will be provided RS1, upper 1/3, rearward on the tank (back) wall.

The cord reel should be configured with three (3) conductors.

**REEL WARRANTY**
The electric reel will come with a five (5) year warranty provided by the reel manufacturer.

**CORD**
Provided for electric distribution will be one (1) length installed on the reel of 100 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt jacketed SOOW cord. No connector will be installed on the end of the cord.

**PORTABLE JUNCTION BOX**
There will be one (1) Akron EJ BX electric junction box(es) provided.

There will be a cable strain relief and direct connection, no plug provided for each box.

Each box will be provided with the following:

• two (2) 15/20 amp 120 volt AC duplex straight blade receptacle with flip up covers
• two (2) 20 amp 120 volt AC twist lock single receptacles with flip up covers
• a 120 volt AC light inside the box

**JUNCTION BOX HOLDER**
There will be an aluminum junction box holder installed adjacent to the cord reel. A total of one (1) will be mounted at pick-up.

**120 VOLT RECEPTACLE**
There will be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed as directed at the pre-construction meeting. The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the onboard generator to shoreline power transfer switch.

There will be a label installed near the receptacle(s) that state the following:
• Line Voltage
• Current Rating (amps)
• Phase
• Frequency
• Power Source

**120 VOLT RECEPTACLE**
There will be two (2), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed one (1) each side in RS2, LS2 on the back wall toward the front corner as high as possible. The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the onboard generator to shoreline power transfer switch.

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

• Line Voltage
• Current Rating (amps)
• Phase
• Frequency
• Power Source

**LOOSE EQUIPMENT**
The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

**NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT**
The following loose equipment as outlined in NFPA 1901, 2016 edition, section 5.9.3 and 5.9.4 will be provided by the fire department.

• 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
• 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
• One (1) handline nozzle, 200 gpm (750 L/min) minimum.
• Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
• One (1) smoothbore of combination nozzle with 2.50" shutoff that flows a minimum of 250 gpm.
• One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
• One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
• One (1) first aid kit.
• Four (4) combination spanner wrenches.
• Two (2) hydrant wrenches.
• One (1) double female 2.50" (65 mm) adapter with National Hose threads.
• One (1) double male 2.50" (65 mm) adapter with National Hose threads.
• One (1) rubber mallet, for use on suction hose connections.
• Two (2) salvage mallets each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m).
• One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High Visibility Public Safety Vests, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
• Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
• Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
• One (1) automatic external defibrillator (AED).
• Four (4) ladder belts meeting the requirements of NFPA 1983, Standard on Fire Service Life Safety Rope and System Components (if equipped with an aerial device).
• If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus.
• If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6.
• If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
• If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

**SOFT SUCTION HOSE**

There will be a 15' length of 6.00" soft suction hose provided with a 6.00" long handle swivel coupling on one (1) end and a 4.50" long handle swivel coupling on the other.

- One (1)-6.00" National Standard hose thread barrel strainer, chrome plated
DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, section 5.9.4 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, section 5.9.4 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PAINT
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.

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 #101 black along with a shield design on the cab face and lower section of the cab and body painted #90 red.
PAINT - ENVIRONMENTAL IMPACT
Contractor will meet or exceed all current State regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient.
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

PAINT CHASSIS FRAME ASSEMBLY
The chassis frame assembly will be finished with a single system black top coat 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
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.

**PAINT, FRONT WHEELS**
All wheel surfaces, inside and outside, will be provided with powder coat paint #101 black.

**PAINT, REAR WHEELS**
All wheel surfaces, inside and outside, will be provided with powder coat paint #101 black.

**HOSE TRAY COATING**
Protective black Safe-Stride® non-slip surface treatment will be provided on the exterior of two (2) hose tray(s). These hose tray(s) will be both side.

**COMPARTMENT INTERIOR PAINT**
The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

**REFLECTIVE STRIPES**
Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" black stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

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

**REAR CHEVRON STRIPING**
There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, will be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.
**JOG(S) IN REFLECTIVE BAND**
The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

**CAB DOOR REFLECTIVE STRIPE**
A 6.00" x 16.00" black 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.

**CAB FACE STRIPE**
There will be a genuine gold leaf stripe across the face of the 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.

**LETTERING**
Sixty-one (61) to eighty (80) genuine gold leaf lettering, 3.00" high, with outline and shade will be provided.

**LETTERING**
Twenty-one (21) to forty (40) reflective lettering, 10.00" high, with outline will be provided.

**MALTESE CROSS INSTALLATION**
There will be one (1) pair of maltese crosses, comprised of reflective material, provided and installed on the front cab doors.

**CAB GRILLE DESIGN**
An American flag design will be painted on the cab grille.

**CUSTOM CHASSIS RUST PROOF / UNDERCOAT**
The rust proof/undercoat option will provide additional paint to the chassis frame rails and a protective coating that will help fight corrosion.

**Rust proof / Undercoat Process**
A coating will be applied to the custom chassis once the cab, pump and body mounting angles have been installed. The coating texture will be waxy and pliable after drying so it will not chip, crack, or peel off during normal vehicle operations.
The rust proofing material will be the color black, and is a coating of a corrosion inhibitor for long-term protection against corrosion.

The material will be applied to the following areas:

- Outside of the chassis frame rails (top & side)
- Top of the frame rails
- Top of crossmembers
- Inside of the frame rails - in and around harnesses keeping coating off harnesses as best as possible
- Between the frame and liner - coating will be applied after frame and liner are assembled using a wand to apply material between as best as possible
- Top of the body mounting angles (including rear platform)
- Top of air tanks
- Top of fuel tank

FACTORY VISIT FINAL INSPECTION
A factory visit will be provided for five (5) persons after the apparatus has been completed and prior to delivery to New Jersey.

FACTORY PRECONSTRUCTION VISIT
A trip to the bidders factory shall be provided for five (5) persons when the approval prints are prepared. The purpose of the trip is to view apparatus under construction to visualize what is being proposed, to review the approval drawings with the contract administrator and any other of the manufacturer's personnel as necessary and to sign the prints to begin the construction process.

FIRE APPARATUS PARTS MANUAL
There will be one (1) custom parts manual(s) in USB flash drive format for the complete fire apparatus provided.

The manual(s) 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

Each manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.
SERVICE PARTS INTERNET SITE
The service parts information included in these manuals are also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

CHASSIS SERVICE MANUALS
There will be one (1) chassis service manuals on USB flash drives containing parts and service information on major components provided with the completed unit.

The manual 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 MANUAL
The chassis operation manual will be provided on one (1) USB flash drive.

ONE (1) YEAR MATERIAL AND WORKMANSHIP
A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

ENGINE WARRANTY
A Detroit Diesel five (5) year limited engine warranty will be provided. A limited warranty certificate, WA0180, is included with this proposal.

STEERING GEAR WARRANTY
A Sheppard three (3) year limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.
FIFTY (50) YEAR STRUCTURAL INTEGRITY
The Pierce custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
The Pierce TAK-4 suspension limited warranty certificate, WA0050, 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.
WATER TANK WARRANTY
A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY
The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY
A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. A six (6) year limited warranty will be provided on painted and satin roll up doors.

The limited warranty certificate, WA0190, is included with this proposal.

PUMP WARRANTY
A Waterous pump limited warranty certificate, WA0225, is included with this proposal.

TEN (10) YEAR PUMP PLUMBING WARRANTY
The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this proposal.

SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY
A Harrison Hydra-Gen limited warranty certificate, WA0285, is included with this proposal.

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.

POWER STEERING CERTIFICATION
The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.
CAB INTEGRITY CERTIFICATION
The fire apparatus manufacturer will provide a cab crash test certification with this proposal. The certification will state that a specimen representing the substantial structural configuration of the cab has been tested and certified by an independent third party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.
- Roof Crush
The cab will be subjected to a roof crush force of 22,500 lb. This value meets the ECE 29 criteria, and is equivalent to the front axle rating up to a maximum of ten (10) metric tons.
- Side Impact
The same cab will be subjected to dynamic preload where 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 force. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.
- Frontal Impact
The same cab will withstand a frontal impact of 32,600 ft-lb of force using a moving barrier in accordance with SAE J2420.
- Additional Frontal Impact
The same cab will withstand a frontal impact of 65,200 ft-lb of force using a moving barrier. (Twice the force required by SAE J2420)

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION
Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.
WINDSHIELD WIPER DURABILITY CERTIFICATION
Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION
Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH
Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

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, at time of delivery, 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, at time of delivery, 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 78 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).
  - 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).
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:

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>Portions of the apparatus manufactured by Pierce shall be free from defects in material and workmanship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date the apparatus is placed in service, or 60 days from the original buyer invoice date, whichever comes first.</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Twelve (12) months.</td>
</tr>
</tbody>
</table>

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, acid 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 transportation, and for risk of loss 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, personal damages for lost profits or revenues, loss of vehicles or products or any associate equipment, cost of substitute vehicles or products, down-time, delay damages, types of economic loss, or any damages for any third party for any such damage.

Note: Any Sunco 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 such vehicle, and not to other warranties made by Pierce in a separate document or to the warranties (if any) made by any manufacturer (other than Pierce) of a vehicle component, attachment or accessory that is incorporated into or attached to the
### 1. LIMITED WARRANTY

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

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>The Pierce Custom Cab shall be free from structural failures caused by defects in material and workmanship.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Ten (10) Years - or - 100,000 Miles</td>
</tr>
<tr>
<td>Conditions and Exclusions:</td>
<td>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.</td>
</tr>
</tbody>
</table>

This warranty does not apply to damage caused by corrosion.

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 the transportation, and for risk of loss 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 profit 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 each 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.

2/8/2010 WA0012
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:

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Ten (10) Years</td>
</tr>
<tr>
<td></td>
<td>This limited warranty is applicable to the vehicle in the following percentage costs of warranty repair, if any:</td>
</tr>
<tr>
<td></td>
<td>Topcoat Durability &amp; Appearance: Gloss, Color Retention &amp; Cracking</td>
</tr>
<tr>
<td></td>
<td>0-72 months 100%</td>
</tr>
<tr>
<td></td>
<td>73-96 months 50%</td>
</tr>
<tr>
<td></td>
<td>97-120 months 25%</td>
</tr>
<tr>
<td></td>
<td>Integrity of Coating System: Adhesion, Blistering/Bubbling</td>
</tr>
<tr>
<td></td>
<td>0-36 months 100%</td>
</tr>
<tr>
<td></td>
<td>37-72 months 50%</td>
</tr>
<tr>
<td></td>
<td>73-120 months 25%</td>
</tr>
<tr>
<td>Conditions and Exclusions:</td>
<td>Corrosion: Dissimilar Metal and Crevice</td>
</tr>
<tr>
<td></td>
<td>0-36 months 100%</td>
</tr>
<tr>
<td></td>
<td>37-72 months 50%</td>
</tr>
<tr>
<td></td>
<td>73-120 months 25%</td>
</tr>
<tr>
<td></td>
<td>See Also Paragraphs 2 thru 4</td>
</tr>
<tr>
<td></td>
<td>Corrosion Perforation</td>
</tr>
<tr>
<td></td>
<td>0-12 months 100%</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Items not covered by this warranty include:</td>
<td></td>
</tr>
<tr>
<td>a) Damage from lack of maintenance and cleaning (proper cleaning and maintenance procedures are detailed in the Pierce operation and maintenance manual).</td>
<td></td>
</tr>
<tr>
<td>b) UV paint fade.</td>
<td></td>
</tr>
<tr>
<td>c) Any cab not manufactured by Pierce.</td>
<td></td>
</tr>
</tbody>
</table>

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, neglected, 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 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 excludes 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.

2/8/2010 WA0055
## Pierce

### 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:

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>The apparatus body shall be free from structural failures caused by defects in material and workmanship.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Ten (10) Years or 190,000 Miles</td>
</tr>
</tbody>
</table>

**Conditions and Exclusions:**

<table>
<thead>
<tr>
<th>See Also Paragraphs 2 thru 4</th>
<th>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.</th>
</tr>
</thead>
</table>

This warranty does not apply to damage caused by corrosion.

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 or damage to the product during transportation.

Within a reasonable time, Pierce shall repair or replace (at Pierce's option and expenses) any nonconforming or defective parts. Repair or replacement shall be made only by a facility approved in advance by 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.

2/8/2010 WA0009
## Limited Warranty

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

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Ten (10) Years</td>
</tr>
<tr>
<td>Conditions and Exclusions:</td>
<td>This limited warranty is applicable to the vehicle in the following percentage costs of warranty repair, if any:</td>
</tr>
<tr>
<td>Topcoat Durability &amp; Appearance: Gloss, Color Retention &amp; Cracking</td>
<td>0-72 months 100% 73-84 months 50% 97-120 months 25%</td>
</tr>
<tr>
<td>Integrity of Coating System: Adhesion, Blistering/Bubbling</td>
<td>0-36 months 100% 37-48 months 50% 49-72 months 25% 73-120 months 10%</td>
</tr>
<tr>
<td>Corrosion: Dissimilar Metal and Crevice</td>
<td>0-36 months 100% 37-48 months 50% 49-72 months 25% 73-120 months 10%</td>
</tr>
<tr>
<td>Corrosion Perforation</td>
<td>0-120 months 100%</td>
</tr>
<tr>
<td>There is no warranty on the vehicle’s interior in warranty only on the Pierce Basic One Year Limited Warranty.</td>
<td></td>
</tr>
</tbody>
</table>

Item 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. 

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, acid, alkali, 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 BUT NOT LIMITED TO 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 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 OR 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
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:

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>Custom chassis frame rail manufactured by Pierce shall be free from defects in material and workmanship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begin:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Fifty (50) Years (Expected Life of Apparatus)</td>
</tr>
<tr>
<td>Conditions and Exclusions:</td>
<td>This warranty does not apply to damage caused by corrosion.</td>
</tr>
<tr>
<td>See Also Paragraphs:</td>
<td>2 thru 4</td>
</tr>
</tbody>
</table>

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, lighting, 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 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, downtime, delay damages, any other types of economic loss, or for any claims by any third party for any such damage.

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.

2/8/2010 WA0013
## Three (3) Year Material and Workmanship

### TAK-4 Independent Front Suspension

#### Limited Warranty

1. **LIMITED WARRANTY**

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

<table>
<thead>
<tr>
<th>Coverage</th>
<th>The TAK-4 Front Independent Suspension and Steering Gears shall be free from defects in material and workmanship.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After</td>
<td>Three (3) Years or 30,000 Miles</td>
</tr>
</tbody>
</table>

#### Conditions and Exclusions:

- **See Also Paragraphs 2 thru 4**
- This limited warranty excludes brake pads, brake rotors, seat boots and shock absorbers.

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 manufacturer 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 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 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 EQUITABLE, 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.

12/16/2013 WA0050
**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:

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>The Meritor axle shall be covered by Meritor as indicated in the attached Meritor warranty coverage description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period</td>
<td>Two (2) Year</td>
</tr>
<tr>
<td>Ends After:</td>
<td></td>
</tr>
</tbody>
</table>

**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:

- 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;

- any vehicle, chassis, or component, part, attachment or accessory damaged by misuse, neglect, defect, fire, exposure to severe environment, acid environment, improper maintenance, accident, crash, or force majeure such as natural disaster, lighting, earthquakes, windstorms, hail, flood, war or riot;

- 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;

- (6) products or parts which rey 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 finished 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) after a period of 5 years from the date of original purchase or (c) 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 period specified in paragraph 1, and shall make the product available for inspection by Pierce or its designated agent. At the request of Buyer, 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 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 EQUITABLE, 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’s incorporated into or attached to the vehicle.
WARRANTY INFORMATION CONTENTS

Effective Model Year 2018 Vehicles

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Heavy Service ...................................................... 7-8
Off-Highway Service ........................................... 9
Terms and Conditions ......................................... 10

How to Read Warranty Coverage

<table>
<thead>
<tr>
<th>Number of Years</th>
<th>Mileage (in thousands)</th>
<th>P=Parts Only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unl=Unlimited</td>
<td>P&amp;L=Parts &amp; Labor</td>
</tr>
</tbody>
</table>

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
<table>
<thead>
<tr>
<th>FD-965</th>
<th>FF-966</th>
<th>FF-967</th>
<th>MFS-10-144A-N</th>
<th>MFS-12-132C-N</th>
<th>MFS-13-122C-N</th>
<th>MFS-14-141A-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>FF-943</td>
<td>MFS-10-122A</td>
<td>MFS-12-122A-N</td>
<td>MFS-13-122A-N</td>
<td>MFS-13-144A-N</td>
<td>MFS-13-144B-N</td>
<td></td>
</tr>
<tr>
<td>FF-944</td>
<td>MFS-10-122A</td>
<td>MFS-12-122B-N</td>
<td>MFS-13-122B-N</td>
<td>MFS-13-144B-N</td>
<td>MFS-13-144C-N</td>
<td></td>
</tr>
<tr>
<td>FF-961</td>
<td>MFS-10-122A-N</td>
<td>MFS-12-122B-N</td>
<td>MFS-13-122B-N</td>
<td>MFS-13-144B-N</td>
<td>MFS-13-144C-N</td>
<td></td>
</tr>
</tbody>
</table>

## Rear Drive Single Axles – 5/750/P&L
<table>
<thead>
<tr>
<th>RS-19-144/145/A</th>
<th>RS-21-160</th>
<th>RS-21-160</th>
<th>RT-34-144/P/A</th>
<th>MA-40-165</th>
<th>MT-40-943</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-21-144</td>
<td>RS-23-161</td>
<td>RS-23-186</td>
<td>RT-40-160/P/2</td>
<td>MT-40-14X/P</td>
<td>RZ-166</td>
</tr>
<tr>
<td>RS-21-145</td>
<td>RS-23-186</td>
<td>RS-23-186</td>
<td>RT-46-160/P/2</td>
<td>MT-40-14X/P</td>
<td>RZ-188</td>
</tr>
</tbody>
</table>

## Drivelines
- RPL
- MXL
- 15SN
- 92N

- 5/50/P, 1/0In/F&L
- 3/350/P, 1/0In/F&L
- 1/0In/VP
- 1/0In/VP

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 lb. 1/100,000
- **LX500 Feature**
  - 5,750 lb. 1/100,000
- **Q+ Drum Brake™**
  - 5,500 lb. 1/100,000
- **ASA**
  - 5,500 lb. 1/100,000
- **Hubs/End Drums and Other Wheel-end Components**
  - 1,000 lb. 1/100,000
- **Hydraulic Disc Brakes**
  - 1,000 lb. 1/100,000
- **All Other Brakes**
  - 1,000 lb. 1/100,000
- **STEELeite X30 Drum Brake™**
  - 12-Years or Wearable Life 1/100,000
- **EX+ Air Disc Brake™**
  - 5,500 lb. 1/100,000

1. Includes bushing, seal, cam, ASA lubrication and wear coverage of 3,500 lb. 1/100,000
2. Based on stamped wear diameter max.

### Trailer Axles
- **Beam and Brackets**
  - 5,500 lb. 1/100,000
- **Wheel End Systems**
  - 1,000 lb. 1/100,000
- **PreSet by Meritor**
  - 5,500 lb. 1/100,000
- **AxlePak®**
  - 5,500 lb. 1/100,000
- **AxlePak®**
  - 7,000 lb. 3,000,000

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 AxlePak® wheel end system, coverage on MTIS thru-tee and stator is 5,500 lb. 3,500,000.
5. When specified with AxlePak® wheel end system, coverage on MTIS thru-tee and stator is 7,000 lb. 3,000,000.

### TAG/Pusher Axles
- **TQ, TQD, TR, TRD Beam and Brackets**
  - 5,750 lb. 1/100,000

1. For brake components and ABS coverage, refer to appropriate product warranties.

### Meritor Tire Inflation System by PSI
- **MTIS Components**
  - 3,500 lb. 1/100,000

### Trailer Air Suspension Systems
- **MPA38/40 (Tandem Axle Parallelogam)**
  - 5,500 lb. 1/100,000
- **Major Structural Components**
  - 5,500 lb. 1/100,000
- **Curbine Damage Warranty**
  - 5,500 lb. 1/100,000
- **Height Control Valve**
  - 1/100,000
- **Shock Absorbers**
  - 2/200,000
- **Air Springs**
  - 2/200,000
- **Bushings**
  - 2/100,000
- **PinLoc Air Controls**
  - 1/100,000
- **PinLoc Actuator**
  - 3/100,000

1. Fastener torque coverage is limited to 2/100,000 when torqued by Meritor (For axle and ABS coverage, refer to appropriate product warranties.)

2. "Curbine damage" is defined as deformation (bending, buckling, or breakage), caused by sudden impact with a curb or similar fixed object. Damage to the RideGentle 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 transferable 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
- 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-9411 for axles, SP-8329 for trailer axles, TP-12128 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Front</th>
<th>Rear</th>
<th>Nominal Rear Load</th>
<th>S/N</th>
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<tbody>
<tr>
<td>FF-941</td>
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<td>MFS-14-143A-N</td>
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<td>MFS-16-143A-N</td>
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1 Can also be used with reduced steer angles in tag position in Coach Applications.

### Rear Drive Single Axles – 2/Unl/P&L

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<td>RC-23-162</td>
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<td>MS-17-14X</td>
<td>MS-23-17X</td>
<td>RC-23-165</td>
<td>MS-26-616</td>
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<td>MS-19-13X</td>
<td>RS-21-145A</td>
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<td>RS-30-185</td>
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1 3/Unl/P&L if Preset by Meritor.

### Rear Drive Tandem – 3/Unl/P&L

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<th>Nominal Rear Load</th>
<th>S/N</th>
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</thead>
<tbody>
<tr>
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<td>RT-46-1641/4/P</td>
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<td>(100)</td>
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<tr>
<td>RT-46-160/P</td>
<td>RT-50-160/P</td>
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### Drivelines

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<tr>
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<tr>
<td>MXL</td>
<td>3/350/P, 1/Unl/P&amp;L</td>
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<tr>
<td>153N</td>
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</tr>
<tr>
<td>92N</td>
<td>1/Unl/P</td>
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</tbody>
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### Rear Drive Tandem/Tridem Axles – 2/Unl/P&L

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<tbody>
<tr>
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<td>MT-44-14X/P</td>
<td>MT-58-616</td>
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<td>RT-34-144/P/A</td>
<td>RT-44-145/P</td>
<td>RT-58-185</td>
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<tr>
<td>MT-40-14X/P</td>
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<td>MT-70-380</td>
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<td>MT-40-144/P</td>
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<td>RT-40-145/A</td>
<td>RT-52-185</td>
<td>RZ-188</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Warranty Information</th>
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</thead>
<tbody>
<tr>
<td>Cam O Series Trailer Brakes</td>
<td>3/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>LX500 Feature</td>
<td>3/Unl/P&amp;L</td>
</tr>
<tr>
<td>Cam P1</td>
<td>2/200/P</td>
</tr>
<tr>
<td>Cam Q+ Drum Brake™</td>
<td>3/Unl/P</td>
</tr>
<tr>
<td>Cam Q+ Drum Brake †</td>
<td>2/200/P&amp;L</td>
</tr>
<tr>
<td>ASA</td>
<td>3/Unl/P</td>
</tr>
<tr>
<td>ASA†</td>
<td>2/200/P</td>
</tr>
<tr>
<td>Hubs/Cast Drums and Other Wheel-end Components</td>
<td>1/Unl/P</td>
</tr>
<tr>
<td>Hydraulic Disc Brakes</td>
<td>1/Unl/P</td>
</tr>
<tr>
<td>All Other Brakes</td>
<td>1/Unl/P</td>
</tr>
<tr>
<td>STEELite X30 Drum Brake™ 12-Years or Wearable Life/P</td>
<td>2/Unl/P&amp;L</td>
</tr>
<tr>
<td>EX+ Air Disc Brake™</td>
<td>2/Unl/P&amp;L</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Warranty Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam and Brackets</td>
<td>5/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Wheel End Systems</td>
<td>1/Unl/P&amp;L</td>
</tr>
<tr>
<td>Standard System</td>
<td>5/P/L</td>
</tr>
<tr>
<td>AxlePak3†</td>
<td>7/P/L</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Warranty Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam &amp; Brackets</td>
<td>6/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Wheel End Systems</td>
<td>1/Unl/P&amp;L</td>
</tr>
<tr>
<td>Standard System</td>
<td>7/P/L</td>
</tr>
<tr>
<td>AxlePak†</td>
<td>7/P/L</td>
</tr>
</tbody>
</table>

1. Includes hub, wheel seals and wheel bearings—all systems require annual inspections and proper documentation to ensure full coverage.

#### Trailer Air Suspension Systems

<table>
<thead>
<tr>
<th>System Description</th>
<th>Warranty Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP38/40 (Tandem Axle Parallelogram)†</td>
<td>5/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Major Structural Components</td>
<td>5/500/P, 1/100/P</td>
</tr>
<tr>
<td>Curbing Damage Warranty†</td>
<td>2/Unl/P&amp;L</td>
</tr>
<tr>
<td>Height Control Valve</td>
<td>2/Unl/P&amp;L</td>
</tr>
<tr>
<td>Shock Absorbers</td>
<td>2/Unl/P&amp;L</td>
</tr>
<tr>
<td>Air Springs</td>
<td>2/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Bushings</td>
<td>7/700/P, 5/500/P</td>
</tr>
<tr>
<td>Pinlock Air Controls</td>
<td>1/Unl/P&amp;L</td>
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<tr>
<td>Pinlock Air Actuator</td>
<td>3/Unl/P&amp;L</td>
</tr>
<tr>
<td>MPA20 (Single Axle Parallelogram)</td>
<td>5/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Major Structural Components</td>
<td>1/Unl/P&amp;L</td>
</tr>
<tr>
<td>Height Control Valve</td>
<td>2/Unl/P&amp;L</td>
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<tr>
<td>Shock Absorbers</td>
<td>2/Unl/P&amp;L</td>
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<tr>
<td>Air Springs</td>
<td>2/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Bushings</td>
<td>1/Unl/P&amp;L</td>
</tr>
<tr>
<td>MTA (Trailing Arm)</td>
<td>5/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Major Structural Components</td>
<td>1/Unl/P&amp;L</td>
</tr>
<tr>
<td>Height Control Valve</td>
<td>2/Unl/P&amp;L</td>
</tr>
<tr>
<td>Shock Absorbers</td>
<td>2/Unl/P&amp;L</td>
</tr>
<tr>
<td>Air Springs and Rebound Straps</td>
<td>2/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>Bushings†</td>
<td>5/Unl/P, 3/Unl/L</td>
</tr>
</tbody>
</table>

(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 Ride Sentry 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 transferable 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

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Warranty Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQ, TQG, TR, TRD Beam and Brackets†</td>
<td>3/Unl/P, 1/Unl/L</td>
</tr>
<tr>
<td>MC12002, MC14002, MC16003, FH946</td>
<td>2/Unl/P&amp;L</td>
</tr>
</tbody>
</table>

(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

<table>
<thead>
<tr>
<th>System Description</th>
<th>Warranty Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTIS Components</td>
<td>3/500/P&amp;L</td>
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</tbody>
</table>
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 Pump
- Construction Material Hauler
- Crash Fire Rescue (CFR)
- Mixer
- Demolition
- Drill Rig
- Dump
- Emergency Service
- Equipment Hauling
- Flattened Trailer Hauler
- Flattened Truck
- Fracturing Truck
- Front Loader
- Geophysical Exploration
- Hopper Trailer Combinations
- Landscaping Truck
- Liquid Waste Hauler
- Log Hauling
- Low boy
- 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 vacations (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 DEM and Meritor approvals. Refer to TP-941 for axles, SP-8320 for trailer axles, TP-12126 for drivelines, and/or contact Meritor regarding specific approval questions on any product line.

Front Drive/Non-Drive Steer Axles – 2/Unit/P&L

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<thead>
<tr>
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<th>FL-941</th>
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<th>MFS-13-155</th>
<th>MFS-22H-135A-N</th>
<th>MX-17-140</th>
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Drivelines

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<tr>
<td>MXL</td>
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Rear Drive Single Axles – 2/Unit/P&L

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<th>MS-17-14X</th>
<th>RS-23-160</th>
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<th>RS-30-616-S</th>
<th>MS-30-616-S</th>
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</thead>
<tbody>
<tr>
<td>MS-17-144/145A</td>
<td>RC-23-161</td>
<td>RC-23-161</td>
<td>RC-23-161</td>
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<td>RS-21-160</td>
<td>MS-26-616</td>
<td>MS-26-616</td>
<td>MS-26-616</td>
<td>MS-26-616</td>
</tr>
<tr>
<td>RS-22-145</td>
<td>MS-26-616-S</td>
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<td>MS-26-616-S</td>
<td>MS-26-616-S</td>
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<td>RC-23-160</td>
<td>RS-26-185</td>
<td>RS-26-185</td>
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<tr>
<td>RH-23-160</td>
<td>MS-30-616</td>
<td>MS-30-616</td>
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</tbody>
</table>
HEAVY SERVICE WARRANTY INFORMATION

Rear Drive Tandem/Tridem Axles – 2/Unl/P&L

<table>
<thead>
<tr>
<th>Model</th>
<th>Component</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT-34-146/P</td>
<td>RT-44-145/P</td>
<td>MT-58-616</td>
</tr>
<tr>
<td>RT-44-146/P/A</td>
<td>RT-46-169</td>
<td>MT-58-616-SP</td>
</tr>
<tr>
<td>RT-40-146/P</td>
<td>MT-52-616</td>
<td>RT-58-185/380</td>
</tr>
<tr>
<td>RT-40-146/A</td>
<td>MT-52-616-SP</td>
<td>RT-70-380</td>
</tr>
<tr>
<td>MT-44-146/P</td>
<td>RT-52-185/380</td>
<td>MT-70-380</td>
</tr>
</tbody>
</table>

1 Axle model designated will vary according to options and variations specified on these axles. Contact Meritor Axle Applications Engineering for details.

Rear Drive Tandem – 3/Unl/P&L

<table>
<thead>
<tr>
<th>Model</th>
<th>Component</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-40-160/P/A</td>
<td>RT-46-160/P/A</td>
<td>MT-58-616</td>
</tr>
<tr>
<td>RT-46-160/P/A/L</td>
<td>RT-46-164/P/A</td>
<td>MT-58-616-SP</td>
</tr>
<tr>
<td>RT-50-160/P/A</td>
<td>RT-52-164/P/A</td>
<td>MT-58-616-SP</td>
</tr>
</tbody>
</table>

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.

Meritor Tire Inflation System by PSI

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>MTIS Components</td>
<td>3/500/P&amp;L</td>
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Trailer Air Suspension Systems

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
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<tbody>
<tr>
<td>MTA (Trailing Arm)</td>
<td>1/Unl/P</td>
</tr>
<tr>
<td>Major Structural Components</td>
<td>5/Unl/P</td>
</tr>
<tr>
<td>Height Control Valve</td>
<td>1/Unl/P</td>
</tr>
<tr>
<td>Shock Absorbers</td>
<td>2/Unl/P</td>
</tr>
<tr>
<td>Air Springs</td>
<td>2/Unl/P</td>
</tr>
<tr>
<td>Bushings</td>
<td>5/Unl/P</td>
</tr>
</tbody>
</table>

1 Raw wood applications 3/Unl/P, 1/Unl/P.

(For axle and ABS coverage, refer to appropriate product warranties.)

Center Non-drive Axles – 2/Unl/P&L

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
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<tbody>
<tr>
<td>MC26000</td>
<td>71063</td>
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<td>79063</td>
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Trailer Axles

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam and Brackets</td>
<td>5/Unl/P</td>
</tr>
<tr>
<td>Wheel End Systems</td>
<td>1/Unl/P</td>
</tr>
<tr>
<td>Standard System</td>
<td>1/Unl/P</td>
</tr>
</tbody>
</table>

1 9000 Series is 3/Unl/P, 1/Unl/P.

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
- Port Tractor
- Rail Yard Spotter
- Roll-On/Roll-Off
- Stevedoring Tractor
- Trailer Spotter
- Specialized Mining
- Excavator
- Compactor
- Fertilizer Spreader
- Snow Blower
- Mining
- Rail Car Mover
- Loader
- Tow Tractor
- Pushback Tractor

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

<table>
<thead>
<tr>
<th>MOR</th>
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<th>MOC</th>
</tr>
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<tbody>
<tr>
<td>FF  - 941</td>
<td>MFS-12-143A-N</td>
<td>MFS-18-135A-N</td>
</tr>
<tr>
<td>FF  - 943</td>
<td>MFS-12-144A-N</td>
<td>MFS-18-193A-N</td>
</tr>
<tr>
<td>FF  - 961</td>
<td>MFS-13-143A-N</td>
<td>MFS-20-133A-N</td>
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<td>FF  - 966</td>
<td>MFS-13-144A-N</td>
<td>MFS-20-135A-N</td>
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<tr>
<td>FG  - 941</td>
<td>MFS-14-143A-N</td>
<td>MFS-20H-193A-N</td>
</tr>
<tr>
<td>FG  - 943</td>
<td>MFS-16-122A-N</td>
<td>MFS-22H-193A-N</td>
</tr>
<tr>
<td>FL  - 941</td>
<td>MFS-16-143A-N</td>
<td>MFS-22H-193A-N</td>
</tr>
<tr>
<td>FL  - 943</td>
<td>MFS-18-133A-N</td>
<td>MON-20 FAMILY</td>
</tr>
</tbody>
</table>

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-193A-N |
| FL  - 941 | MFS-16-143A-N | MFS-22H-193A-N |
| FL  - 943 | MFS-18-133A-N | MON-20 FAMILY |

Drivelines – 1/Unl/P

<table>
<thead>
<tr>
<th>@PL</th>
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<tr>
<td>MT-44-144/P</td>
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<tr>
<td>MT-52-615</td>
<td>MT-58-616-SP</td>
</tr>
<tr>
<td>MT-52-615-SP</td>
<td>MT-70-380</td>
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<tr>
<td>RT-44-145/P</td>
<td>RT-46-160/P</td>
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<tr>
<td>RT-50-166/P</td>
<td>RT-46-164/H/P</td>
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<td>RZ-166</td>
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Rear Drive Tandem Axles – 2/Unl/P

<table>
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<tr>
<th>Brake Components</th>
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<tbody>
<tr>
<td>Cam P</td>
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<tr>
<td>Q+ Drum Brake™</td>
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<tr>
<td>ASA</td>
</tr>
<tr>
<td>Hubs/Cast Drums and Other Wheel-end Components</td>
</tr>
<tr>
<td>Hydraulic Disc Brakes</td>
</tr>
<tr>
<td>All Other Brakes</td>
</tr>
<tr>
<td>3/Unl/P</td>
</tr>
<tr>
<td>3/Unl/P &amp; L</td>
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<tr>
<td>1/Unl/P</td>
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</table>

Planetary Axles – 1/Unl/P

<table>
<thead>
<tr>
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<th>MDT</th>
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</tr>
<tr>
<td>RS-24-160</td>
<td>MS-30-616-SP</td>
<td>MS-35-380</td>
<td></td>
</tr>
</tbody>
</table>
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/UnM/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.
(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 application as detailed elsewhere in this warranty statement.

Some components are warranted for parts only and the Owner must pay 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/UnMP) 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-12176 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 location 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 drive axle 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/UnMP) 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.

Meritor Heavy Vehicle Systems, LLC
2135 West Maple Road
Troy, Michigan 48064 USA
For more information: call Ontrak at 866-668-7221 or visit meritor.com
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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

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 repair are performed without authorization. This also voids any future warranty.

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.

Towing is covered to the nearest distributor or authorized dealer only when necessary to prevent further damage to your transmission.

Labor costs for the removal and reinstalation of goods may be covered when necessary to make repairs. Please contact your OEM for authorization.

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.

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 stress of 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.

2. DISCLAIMER 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 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 damaged. 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, 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.

2/22/2012 WA0216
Three (3) Year Material and Workmanship
Meritor Wabco ABS Brake System
Limited Warranty

1. LIMITED WARRANTY

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 each such part, component, 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, acid 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 non-conformity is not due to misuse, neglect, accident or improper maintenance, Buyer must notify Pierce within thirty (30) days after the date of discovery, and unless 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.

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.
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 vocational/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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Heavy Service ............................................................................................................................................... 5
Industrial/Off-Highway Service .................................................................................................................... 6
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How to Read Warranty Coverage (Example)

<table>
<thead>
<tr>
<th>Number of Years</th>
<th>Mileage (in thousands)</th>
<th>P=Parts Only</th>
<th>P&amp;L=Parts &amp; Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>300</td>
<td>P</td>
<td></td>
</tr>
</tbody>
</table>

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 Pump
• 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 Components

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) 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 1/100/P&L
Trailer ABS Valve 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.

Effective Model Year 2018 Vehicles 5
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/Un/Un) 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

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:

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>Command Zone control modules shall be free from failures caused by defects in material and workmanship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Five (5) Years</td>
</tr>
</tbody>
</table>

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, exotic 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;

(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 finished 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 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 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 Surplus 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 any 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 ASSESSED OR OTHERWISE TRANSFERRED BY THE BUYER TO ANY SUBSEQUENT USER OR PURCHASER OR TO ANY OTHER PERSON OR ENTITY.

2/8/2010 WA0014
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: | 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. |

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 not be responsible for Buyer’s 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;

(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 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.

7/5/2011 WA0203
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 |

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).

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 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 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 ARISING OUT OF BREACh OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORY OF LAW OR EQUITABLE RIGHTS 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.

2/22/2010 WA0018
### Ten (10) Year Material and Workmanship
#### Stainless Steel Piping

**Limited Warranty**

**1. LIMITED WARRANTY**

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

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>Stainless steel piping shall be free from structural failures caused by defects in material and workmanship, or perforation caused by corrosion.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty Begins:</td>
<td>The date of the original purchase invoice (issued when the product ships from the factory).</td>
</tr>
<tr>
<td>Warranty Period Ends After:</td>
<td>Ten (10) Years or 100,000 Miles</td>
</tr>
</tbody>
</table>

**Conditions and Exclusions:**

Pierce's obligation under this warranty is limited to repairing or replacing without charge, as Pierce may elect, the stainless steel piping or components which Pierce determines to have failed due to defective material and workmanship, or perforation caused by corrosion.

This warranty does not cover the use of fluoroprotein (FP) type foam. The sodium chloride within FP foam can cause long-term damage to system components if not thoroughly flushed immediately after use.

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

- 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 have no obligations to Buyer the applicable warranties, if any, made by the respective manufacturers thereof;

- 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, collision, or care such as natural disaster, lightning, earthquake, windstorm, hail, flood, war or riot;

- 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

- 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**

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 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 by 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 separate documents (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.

3/22/2012 WA0035
Limited Warranty on New Detroit Diesel
DD13 Engines
Used In Fire Truck or Crash Vehicle Applications

Terms of Coverage:

Uses
This warranty applies to the first retail purchaser and subsequent owners during the WARRANTY PERIOD of new DD13 Engines (referred to as Engine) manufactured by Detroit Diesel and/or supplied by Detroit Diesel or Detroit Diesel of Canada Limited (which are collectively referred to as Detroit Diesel) for use in fire truck or crash vehicle applications.

Defects
This warranty covers Engine REPAIRS to correct any malfunction occurring during the WARRANTY PERIOD resulting from defects in material or workmanship.

Repairs
To obtain warranty repairs, you must request the needed repairs within the WARRANTY PERIOD from an authorized Detroit Diesel service outlet. Only new genuine parts, remanufactured parts or components supplied or approved by Detroit Diesel will be used. Detroit Diesel may, at its discretion, replace rather than repair components. A reasonable time must be allowed to perform the warranty repair after taking the engine to the authorized service outlet. Repairs will be performed during normal business hours.

Warranty Period
The WARRANTY PERIOD begins on the date the engine is delivered to the first retail purchaser or put in use prior to sale at retail, whichever date occurs first, and ends at the time or mileage/kilometer limits shown below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Warranty Limitations (Whichever Occurs First)</th>
<th>Repair Charge To Be Paid By Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td>5,000 MILES / 100,000 KM</td>
<td>Parts: No Charge, Labor: No Charge</td>
</tr>
<tr>
<td>Accessory*</td>
<td>2,000 MILES / 100,000 KM</td>
<td>Parts: No Charge, Labor: No Charge</td>
</tr>
</tbody>
</table>

Service Supplies
The cost of service supplies such as coolant, oil and filters which are not reusable due to needed repairs is covered by this warranty.

Like Replacement Engine
Engine(s) supplied by Detroit Diesel as a replacement for an Engine still under warranty will assume the identity of the Engine being replaced and be entitled to the remaining warranty coverage.

Engine Removal and Reinstallation
Reasonable labor costs for engine removal and reinstallation, when necessary to make a warranty repair, are covered by this warranty.

Towing
During the base warranty period reasonable towing costs to the nearest authorized service outlet are covered by the warranty when due to warrantable failure and the engine is either inoperable, cannot be safely operated or continued operation would cause further damage to the Product.

This Warranty Does Not Cover:

Repairs Due To Accidents, Misuse, Alteration, Storage Damage, Negligence Or Certain Modifications
Repairs due to an accident, misuse, alteration, misapplication, storage damage, negligence or modification exceeding Detroit Diesel specifications, are not covered by this warranty.

Maintenance
Detroit Diesel is not responsible for the cost of maintenance or repairs due to lack of performance of required maintenance services or the failure to use fuel, oil, lubricants and coolant meeting Detroit Diesel-recommended specifications. Performance of the required maintenance and use of proper fuel, oil, lubricants and coolant are the responsibility of the owner. See the Engine Operator’s Guide for full details.

Incidental or Consequential Damages
Detroit Diesel is not responsible for incidental or consequential costs or expenses which the owner may incur as a result of a malfunction or failure covered by this warranty, such as communication expenses, meals, lodging, overtime, loss of use of the Engine or vehicle ("downtime"), loss of time, inconvenience, cargo loss or damage, and other similar costs and expenses.

Other Limitations
The performance of REPAIRS is the exclusive Owner’s remedy under this warranty. Detroit Diesel does not authorize any person to assume or create for it any other obligation or liability in connection with the Engine or the Accessories.

This LIMITED WARRANTY AND THE EMISSIONS CONTROL WARRANTY ARE THE ONLY WARRANTIES APPLICABLE TO THE ENGINE AND ACCESSORIES AS USED IN FIRE TRUCK OR CRASH VEHICLE APPLICATIONS. DETROIT DIESEL MAKES NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. DETROIT DIESEL SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES AS DESCRIBED ABOVE.

Some states do not allow the limitation of how long this warranty may last or the limitation or exclusion of incidental or consequential damages, so the above may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

Detroit Diesel
DEMAND PERFORMANCE
13400 Outer Drive, West / Detroit, Michigan 48239-4001
Telephone: 313-592-5000
www.detroitdiesel.com

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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

• WARRANTABLE 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 exceptions:

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

<table>
<thead>
<tr>
<th>APPLICABLE MODELS</th>
<th>WARRANTY LIMITATIONS (Whichever occurs first)</th>
<th>ADJUSTMENT CHARGE TO BE PAID BY THE CUSTOMER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Months</td>
<td>Transmission Miles Or Kilometers</td>
</tr>
<tr>
<td>MT, MD 3000, 3200, 3500, 3700</td>
<td>0–24</td>
<td>No Limit</td>
</tr>
<tr>
<td>HT with Hydraulic Controls</td>
<td>0–24</td>
<td>No Limit</td>
</tr>
<tr>
<td>AT, 1000 Series™, 2000 Series™, 2400 Series™</td>
<td>0–36</td>
<td>No Limit</td>
</tr>
<tr>
<td>HT with Electronic Controls</td>
<td>0–60</td>
<td>No Limit</td>
</tr>
<tr>
<td>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</td>
<td>0–60</td>
<td>No Limit</td>
</tr>
</tbody>
</table>

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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. 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

Form SE0616EN (201009)
Waterous Five-Year Limited Warranty

WATEROUS warrants, to the original Buyer only, that products manufactured by WATEROUS will be free from defects in material and workmanship under normal use and service for a period of five (5) years from the date the product is first placed in service, or five and one-half (5-1/2) years from the date of shipment by WATEROUS, whichever period shall be the first to expire; provided the Buyer notifies WATEROUS, in writing, of the defect in said product within the warranty period, and said product is found by WATEROUS to be nonconforming with the aforesaid warranty. When required in writing by WATEROUS, defective products must be promptly returned by Buyer to WATEROUS at WATEROUS' plant at South St. Paul, Minnesota, or at such other place as may be specified by WATEROUS, with transportation and other charges prepaid. A Returned Material Authorization (RMA) is required for all products and parts and may be requested by phone, fax, email, or mail. The aforesaid warranty excludes any responsibility or liability of WATEROUS for:

(a) damages or defects due to accident, abuse, misuse, abnormal operating conditions, negligence, accidental causes, use in non-firefighting applications, or improper maintenance, or attributable to written specifications or instructions furnished by Buyer;
(b) defects in products manufactured by others and furnished by WATEROUS hereunder, it being understood and agreed by the parties that the only warranty provided for such products shall be the warranty provided by the manufacturer thereof which, if assignable, WATEROUS will assign to Buyer, if requested by Buyer;
(c) any product or part, altered, modified, serviced or repaired other than by WATEROUS, without its prior written consent;
(d) the cost of dismantling, removing, transporting, storing, or insuring the defective product or part and the cost of reinstallation; and
(e) normal wear items (packing, strainers, filters, light bulbs, anodes, intake screens, mechanical seals, etc.).

ALL OTHER WARRANTIES ARE EXCLUDED, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, OR ANY OTHER CAUSE OF ACTION, SHALL WATEROUS BE LIABLE FOR ANY PUNITIVE, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR PERSONAL INJURY OR PROPERTY DAMAGES.

The exclusive remedy of Buyer and the sole liability of WATEROUS, whether based on contract, warranty, tort or any other basis of recovery whatsoever, is expressly limited at the election of WATEROUS to:

(a) the replacement at the agreed point of delivery of any product or part, which upon inspection by WATEROUS or its duly authorized representative, is found not to conform to the limited warranty set forth above, or
(b) the repair of such product or part, or
(c) the refund or crediting to Buyer of the net sales price of the defective product or part.

BUYER'S REMEDIES CONTAINED HEREIN ARE EXCLUSIVE OF ANY OTHER REMEDY OTHERWISE AVAILABLE TO BUYER.

Waterous Company
125 Hardman Avenue South
South St. Paul, MN 55075 USA
www.waterousco.com

F-2113 (07/17/12)
MANUFACTURER’S LIMITED WARRANTY - HYDRAULIC GENERATORS

FIRE & EMERGENCY Vocation

Harrison Hydra-Gen® (Seller) extends to the original purchaser (Buyer) of goods for use (whether it be an OEM, dealer, re-seller, or end-user) the following warranty covering the Harrison Hydra-Gen® Generator System, subject to the qualifications indicated. Harrison Hydra-Gen® Generator Systems shall consist of a Harrison generator tray assembly and its’ components, a Harrison hydraulic pump assembly, and a Harrison supplied meter assembly; unless otherwise specified in below guidelines.

Harrison Hydra-Gen® warrants the original purchaser that the Generator System manufactured or supplied by Harrison Hydra-Gen® will be free from defects in materials and workmanship, provided such goods are:

1. Installed, operated and maintained in accordance with the Harrison Hydra-Gen® owner’s manual, and/or written installation addendums.
2. Each new application has been reviewed and approved by the Harrison Hydra-Gen® Application Engineering Group.

PERIOD OF WARRANTY

*Six (6) years or 1000 hours of usage, whichever comes first, from the date the product is shipped from Harrison to the Installer.

*The END USER must complete and return to Harrison Hydra-Gen® the Harrison Hydra-Gen® Warranty Registration Card, Form WR-1, provided in the generator manual and provided online @ www.harrisonhydagen.com, within 45 days of delivery.

Warranty includes all parts and labor. In addition, maintenance items that are contaminated or damaged by a proven warrantable failure are covered in years 1-2, and Labor time up to 4 hours, travel time up to 2.5 hours, and mileage up to 100 miles for warranty related repairs are covered in years 1-2.

Repair or replacement parts are warranted for ninety (90) days from date of purchase, excluding labor and travel expenses. Any part repaired or replaced during the warranty period assumes the remainder of the warranty or ninety (90) days, whichever is greater.

Only components supplied by Harrison Hydra-Gen® are covered under this warranty.
There is no other express warranty. Implied warranties, including merchantability and fitness for a particular purpose, are limited to periods set forth above and to the extent permitted by law. Any and all implied warranties are excluded. In no event is Harrison Hydra-Gen® liable for incidental or consequential damages.

The Buyer (OEM, dealer, re-seller, or end-user) must notify Harrison Hydra-Gen®, an Authorized Distributor, or a designated Harrison Hydra-Gen® Service Representative, in writing, within thirty (30) calendar days after goods or parts failed to meet this warranty.

The sole liability of Harrison Hydra-Gen® and the Buyer’s sole remedy for a failure of goods under this warranty and for any and all other claims arising out of the purchase and use of the goods, including negligence on the part of the manufacturer, shall be limited to the repair or replacement of the product, at the option of Harrison Hydra-Gen®, of the parts that do not conform to this warranty, provided that the product or parts are returned to the Harrison Hydra-Gen® manufacturing facility.

A Returned Goods Authorization (RGA) is required for all products and parts being returned, and may be requested by phone, fax, email, or mail.

Failure to make timely delivery to Harrison Hydra-Gen® of the goods claimed to be defective shall void any warranty.

Unless previous written agreements have been made between the Buyer and Harrison Hydra-Gen®, the Buyer shall be responsible for all freight and shipping charges in connection with the delivery of the goods claimed to be defective, to Harrison Hydra-Gen® at its manufacturing facility, and the return of repaired or replacement goods to the Buyer.

If Harrison Hydra-Gen® determines that no warranty coverage is available for goods claimed to be defective, whether determination is based on the warranty being voided, the product failure being due to a cause not covered by the warranty, the failure to make a timely and proper warranty claim, or otherwise, the Buyer shall have the option of either:
1. Having the goods not repaired and returned to the Buyer, freight collect.
2. Having the goods repaired, If Harrison Hydra-Gen® determines that the product is repairable, and returned to the Buyer, freight collect. The Buyer will be responsible for all costs associated with the repair and testing of the goods and shall authorize Harrison Hydra-Gen®, in writing, to have the goods repaired and tested by Harrison Hydra-Gen®.

The owner is obligated to operate and maintain the goods in accordance with the recommendations published by Harrison Hydra-Gen® in the owner's manual. The owner is
responsible for the costs associated with such maintenance and any adjustments that may be required.

This warranty shall not apply to:

1. Damages or defects caused by normal wear, accident, misuse, abuse, abnormal operating conditions, negligence, corrosion, accident causes, or attributable to written specifications or instructions furnished by the installer.
2. Damages or defects caused by improper maintenance in accordance with the Harrison Hydra-Gen® product manuals and operating guidelines.
3. Damages caused by operator error.
4. Damages or defects caused by improper installation.
5. Damages or defects caused by inadequate water drainage provided by the installer in the area where the generator is installed or stored.
6. Damages or defects caused by inadequate air flow space or ventilation provided by the installer in the area where the generator is installed.
7. Any product or part altered or modified by the installer or service facility without written prior consent by Harrison Hydra-Gen®.
8. Cost of normal maintenance, adjustments, installation or start-up.
9. Normal wear items and components needing periodic maintenance such as a rubber hoses and filters.
10. Excessive labor due to components being concealed in vehicle as a result of installation.
11. Water, road debris, excessive dirt, salt, abrasive particles, or large foreign objects found in the generator.
12. Telephone or other communications expense.
13. Paint, hydraulic fluid, and interconnecting hoses (internal or external to system assemblies).

This warranty gives you specific legal rights, and you may also have other rights that may vary from state to state or province to province.

No person is authorized to give any other warranties or to assume any other liabilities behalf of Harrison Hydra-Gen®, unless made or assumed in writing by an officer of Harrison Hydra-Gen®.

Contact Harrison Hydra-Gen® for questions regarding your warranty rights and responsibilities at (281) 807-4420; or visit our website at www.harrisonhydragen.com.

NOTE: Please refer to the MANUFACTURER’S LIMITED WARRANTY; IHT SYSTEMS for warranty guidelines specific to the IHT system.
LIMITED WARRANTY: The R. H. Sheppard Co. Inc., ("Sheppard") warrants all M110PKG1 and M110SAU1 steering gears manufactured and sold to Pierce Manufacturing Inc. ("Pierce") for application on Pierce TAK-4 equipped vehicles to be free from defects of workmanship and material under normal use and service for a period of thirty six months from the in service date of the vehicle to its original owner.

Vehicle applications where Sheppard product is used require an application approval before production build. If Pierce uses Sheppard product for any purpose or application which has not been approved by Sheppard in advance, including aftermarket devices (defined as a device added to the steering system directly or indirectly affecting the performance or operation of the Sheppard product in its approved application) not tested and approved by Sheppard this limited warranty SHALL NOT APPLY AND SHALL BE VOID. SHEPPARD MAKES NO OTHER WARRANTY, EITHER EXPRESS OR IMPLIED. SHEPPARD EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

SHEPPARD SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES OR FOR LOSS OR DAMAGE DIRECTLY OR INDIRECTLY ARISING FROM THE USE OF A PRODUCT. Pierce expressly acknowledges its obligation to inform all users (customers) of the above disclaimer.

CONDITIONS: Claims under this Limited Warranty may only be made by Pierce. In no event shall Sheppard be held liable for warranty charges by unauthorized persons. No allowance will be made for repairs or alterations, unless made with the written consent of Sheppard. Authorized Pierce dealers shall be the only authorized repair facility for Sheppard products applied to Pierce vehicles.

Any warrantable repair made under this Limited Warranty must be made on or before 36 months of the in-service date for the Product to which the claim relates. Sheppard shall not be liable for claims made after such date. Sheppard product fitted to Pierce vehicles that are repaired at a repair facility other than an authorized Pierce dealer within the warranty period will be considered for payment under the guidelines of this agreement only by joint written consideration of Sheppard and Pierce warranty departments. It shall be the responsibility of the Pierce warranty department to notify Sheppard if and when this situation occurs. Sheppard will not be held responsible for damage to other steering components such as but not limited to pumps and reservoirs due to improper adjustment of steering gear relief plungers. Vehicle downtime and towing will not be considered under warranty.

REMEDIES: The sole and exclusive remedy of Pierce for Sheppard's breach of the foregoing warranty is limited to the return and repair or reimbursement as follows:
R. H. SHEPPARD CO., INC. WARRANTY
Pierce Manufacturing Inc.
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Warranty Support: In support of the Pierce dealer network, Sheppard will provide a toll-free "Hotline" service to assist in the diagnosis and troubleshooting of steering problems. The R. H. Sheppard Co., Inc. Field Service Department can be reached at 1-800-274-7437 for assistance. Sheppard will require that Pierce dealers contact this toll-free "Hotline" for approval before product is removed from a vehicle in a warranty situation. When contacted regarding a warranty situation, the Sheppard representative will provide an authorization number for removal of the product. This Returned Goods Authorization (RGA) number must be included in all warranty correspondence and attached to all returned goods.

Procedure: In the event of a warranty situation, the servicing dealer shall contact the Sheppard Hotline and receive an RGA number before replacing any steering gear. For M110PKG1 and M110SAU1 steering gear models, the dealer will first obtain an RGA number from Sheppard, and then order the replacement gear from Pierce. Replacement M110PKG1 and M110SAU1 steering gears shall be shipped from Pierce once those models are in full production. A warranty claim for both parts and labor will then be generated by the dealer and sent to Pierce. After reviewing the claim, Pierce will submit it to Sheppard for reimbursement.

Parts Reimbursement: Sheppard agrees to reimburse Pierce at Pierce’s purchase price plus 30% mark-up for parts found to be defective within the warranty period. Parts being returned for warranty consideration shall be sent to the R. H. Sheppard Company, 447 E. Middle St., Hanover, PA 17331 ATTN: Warranty Dept. Sheppard’s determination as to whether the part is covered by the foregoing warranty is final and conclusive. Sheppard requires the return of complete steering gears only. Individual seals replaced under warranty should not be returned unless specifically requested by Sheppard. All parts being returned for warranty consideration must be clearly tagged with all pertinent warranty information including, but not limited to (1) Returned Goods Authorization number (RGA); (2) claim number; (3) date in service; (4) date of failure; (5) mileage; (6) part number; (7) labor hours; (8) dealer labor rate and; (9) dollar amount claimed. Claims submitted without prior authorization are subject to rejection under this agreement.

Labor: Labor to repair Sheppard product found to be defective within the warranty period will be reimbursed at not more than 10 hours per vehicle. Labor shall be reimbursed at the rate of $85.00 USD per hour for M110PKG1 and M110SAU1 steering gears.

Freight: Pierce will collect M110PKG1 and M110SAU1 warranty material at a designated collection point. Inbound freight to the Pierce collection point will be the responsibility of Pierce. All warranty material should be returned from the Pierce collection point to R. H. Sheppard Co. Freight Collect by a Sheppard-specified common carrier based on location of the Pierce collection point. Sheppard does not require the return of failed seals. Any freight charges incurred for the return of seals will be the responsibility of Pierce. Parts returned for warranty consideration without prior authorization are subject to rejection under this agreement and may be subject to a charge back of inbound freight charges. Parts rejected under this warranty will be returned to Pierce Freight Collect or scrapped by Sheppard at Pierce’s discretion.
**Outside Purchases:** Pierce authorized dealers shall be the only outlet for repair, warranty service and parts for Sheppard products applied to Pierce vehicles. Sheppard will not be responsible for consumables such as hoses, belts, fluids, fittings or miscellaneous shop material that may be required for the repair of the product.

**Warranty Documentation:** Warranty credit memos will be issued monthly to the Pierce Warranty Department. Monthly credit memos will include (1) claim number; (2) part number; (3) parts reimbursement; (4) labor reimbursement; (5) any applicable Pierce reference number and; (6) reason for rejection or acceptance of the claim. Credit memos will be issued in U.S. funds. Debits for warranty claims will not be accepted under this agreement. Claim disposition will constitute the final and conclusive resolution of warranty claims.

**Parts Retention:** Sheppard will retain parts submitted for warranty consideration for a period of sixty (60) days for any material found to be rejected for warranty. Sheppard will notify Pierce within sixty (60) days of receipt of Sheppard's determination as to whether any such part is covered by this warranty. Warranty reimbursement will be issued within thirty days of receipt of material at Sheppard.

**Good-Will Requests:** Good-Will requests will be considered jointly between Sheppard and Pierce for equitable compensation.

**RECALLS:** Sheppard retains the right to review information regarding federal motor vehicle recall and/or product repair programs if Sheppard products fitted to Pierce vehicles are alleged to be non-compliant with federal motor vehicle safety standards. Sheppard retains the right to review any claims of product defect or non-compliance before participating in reimbursement of expenses incurred as a result of alleged non-compliance or defect of its products. Sheppard agrees to negotiate in good faith for the reimbursement of expenses incurred by Pierce for all administrative, material and labor cost and expense associated with any recall where Sheppard product is found to be defective or non-compliant with federal motor vehicle standards.

**MISCELLANEOUS:** This writing constitutes the full complete and final statement of Sheppard’s limited warranty for M110PKG1 and M110SAU1 products sold to Pierce. All prior oral or written correspondence, test data, negotiations, representations, understandings and the like regarding products are merged in this writing and extinguished by it. This limited warranty may not be altered, amended extended or modified except by a writing signed by the President or Vice President of Sheppard. No employee, vendor, dealer, distributor or other representative of Sheppard has authority to make statements to extend, expand, alter or amend the terms of this Limited Warranty. Sheppard expressly disclaims any statements contrary to the Limited Warranty. Sheppard's failure at any time to enforce any of the terms and conditions stated herein shall not constitute a waiver of any provisions herein. This Limited Warranty shall be governed by and construed in accordance with the laws of the Commonwealth of Pennsylvania.
R. H. SHEPPARD CO., INC. WARRANTY
Pierce Manufacturing Inc.
Page 4

Any legal actions which may arise as a result of disputes, controversies or claims arising out of or related to this limited warranty shall be in such forum as Sheppard and Pierce shall agree, or, in the absence of agreement, in a court of appropriate jurisdiction other than in the county in which either party is located. This Limited Warranty shall not be assigned by Pierce.

COOPERATIVE EFFORT: Sheppard and Pierce agree to work cooperatively toward expanding this warranty coverage to a period of sixty months from the in service date. These cooperative efforts shall focus on examining the effects of increased heat generated by 2007 model engines and its impact on the entire power steering system.

AGREEMENT: This agreement is effective April 3, 2006 and may be modified by mutual agreement between Sheppard and Pierce of a signed amendment to be attached to the original Limited Warranty. There are no third party beneficiaries to this Limited Warranty. This warranty agreement applies to Pierce authorized dealers only. It does not encompass any special arrangements that Pierce may now have or that Pierce may enter into, with any other segments of the trucking industry. This warranty agreement does not apply to non-conforming product removed at Pierce assembly plants.

This Limited Warranty agreement between the R. H. Sheppard Co., Inc and Pierce Manufacturing Inc. may be terminated by either party with thirty days written notice prior to termination.

Signed at Pierce Manufacturing Inc., Appleton, WI this _____ day of ______________, 2006.

R. H. SHEPPARD CO., INC.

Authorized Signature

Title

PIERCE MANUFACTURING INC.

Authorized Signature

Title

All mechanical components of the door shall be warranted to be free from defects in materials and workmanship for the lifetime of the vehicle. All parts covered under this warranty shall be to the original owner.

A&A manufacturing warrants that painted doors shall be free of blistering, peeling, bubbling, or any other adhesion defect caused by defective manufacturing methods or paint material selection. The time period for the coverage shall be 6 years from date of door shipment to Pierce. Satin anodized finish doors shall be warranted for 6 years against corrosion defects from date of door shipment to Pierce. Replacement of decals/Scotchlite is not covered.

The maximum amount A&A will reimburse for labor is $60.00 per hour and the maximum amount of time allowed for repair is as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door</td>
<td>1.0 Hr.</td>
</tr>
<tr>
<td>Slat Replacement</td>
<td>1.0 Hr.</td>
</tr>
<tr>
<td>Pennant Plate Replacement</td>
<td>1.0 Hr.</td>
</tr>
<tr>
<td>Roller Replacement</td>
<td>.5 Hr.</td>
</tr>
<tr>
<td>Seal Replacement</td>
<td>.5 Hr.</td>
</tr>
<tr>
<td>Switch/Magnet Replacement</td>
<td>1.0 Hr.</td>
</tr>
<tr>
<td>Travel Time</td>
<td>4.0 Hr.</td>
</tr>
</tbody>
</table>
LIFETIME SERVICE WARRANTY

United Plastic Fabricating, Inc. (hereinafter called “UPF”) warrants each POLY-TANK®, Booster/Foam Tank POLYSIDE® Wetside Tank, Integrator Tank/Body, ELLIPSE™ Elliptical Tank, Ellip-T-Tank Tank and DEFENDER™ Skid Tank to be free from defects in material and workmanship for the service life of the original vehicle (vehicle must be actively used in an emergency response for fire suppression). All UPF Tanks must be installed and operated in accordance with the UPF Installation and Operating Guidelines. Failure to do so can void the warranty.

Every UPF Tank is inspected and tested before leaving our facility. Should your UPF Tank require service, please notify UPF via email, fax, in writing or by calling UPF at 1-978-975-4520. Please provide the serial number, a description of the service request, the location along with the phone number and name of the contact person. Our goal is to have scheduled work completed within a reasonable time period.

Under a valid warranty claim, UPF will cover the cost to repair the UPF Tank including the customary and reasonable costs to make the tank accessible such as the removal and reinstallation of the tank if authorized in advance (pre-approved) by UPF. The warranty will not cover tanks that have been improperly installed, operated, misused, abused, or modified from its intended or designed use. Serial number must not have been altered, defaced or removed. Tanks that are not stored or installed properly which results in the tank suffering UV damage will not be covered by this agreement.

Should UPF determine that the service claim is valid under this warranty for a tank located outside of the United States and Canada, UPF will assume the costs for labor and material for the warranty repair as described above plus all travel costs to the U.S. port of embarkation. Costs for airline travel outside of the U.S. and Canada will not be the responsibility of UPF.

In the event the tank shall become stationed in an area of the world that is considered to be a war zone or where unsafe conditions exist for the safe passage of United States Nationals, as reported by the United States Department of State, (http://www.state.gov), and a request to perform service or warranty repairs, UPF reserves the right to refuse to honor such requests. It is the purchaser’s responsibility to relocate the tank to an area where such repairs can be performed without undue risk to UPF employees or their designee. UPF will make every reasonable effort to support our products though alternative means.

For Ellipse™ elliptical tanks, a separate five year warranty provided by the subcontractor is applied to the sub-frames, chute linings (rubber isolation strips) and metal components. The stainless steel wrap provided by UPF shall be warranted by the subcontractor performing the wrap installation in accordance with their warranty in place at the time of the installation. UPF will not be liable for any warranty costs associated with the wrap, sub-frames, chute linings (rubber isolation strips) and metal components but will assist with all claims on behalf of its customer.

For PolySide® wetsided tanks and Integrator™ Tank/Body units, all polypropylene components related to the tank shall carry the standard UPF lifetime

Continued on back
service warranty. Other polypropylene components, including but not limited
to compartments, wheel wells, fenders and other body related components
shall be warranted by UPF for a period of ten years. The warranty for the
PolySide® and Integrator™ units excludes paint or hardware, which shall be
covered by the manufacturer of the paint/hardware.

All UPF tanks 50 gallons or less utilized for non-fire applications and installed
on specialty vehicles such as ATVs, trailers, boats, etc. are covered under a
separate warranty policy available from UPF. Further, UPF Protector™ foam
and water trailers are warranted under a separate warranty policy available
from UPF.

This UPF warranty is transferable within the United States only with prior writ-
ten approval by UPF (except an original apparatus manufacturer may assign
this warranty to the first titled owner/lessee of the apparatus).

UPF will NOT reimburse any unnecessary work and/or work that has
not been pre-approved. Any and all third party charges must be pre-
authorized and approved in writing by UPF prior to commencing the
work. Any unauthorized third party repairs, alterations, actions or modi-
fications will not be covered and can void the warranty. UPF will be the
sole determining authority as to whether a service claim will be valid
and covered under this warranty.

In no event will UPF be liable for an amount in excess of the purchase price
of the booster/foam tank at the time of manufacture or for any loss or dam-
age, whether direct, indirect, incidental, consequential, or otherwise arising
out of failure of its product. Loss of contents (water, foam, etc.) shall not be
the responsibility of UPF. Further, UPF is not responsible for costs associated
with service repairs to chassis, sub-frames, bodies, valves, dumps, hoses,
pressure vacuum vents, and other components (i.e. liquid level transducers,
etc.). Further, UPF will not cover the cost for travel of the vehicle to and from
a repair facility.

This warranty contains the entire warranty. It is the sole warranty and price
agreements or representation, whether oral or written, are either merged
herein or expressly cancelled. UPF neither assumes, nor authorizes any per-
son supposing to act on its behalf to change, nor assume for it, any warranty
or liability concerning its product.

This warranty gives you specific legal rights, and you may also have other
rights which vary from state to state. Some states do not allow exclusion or
limitation or incidental or consequential damage, so the above limitation or
exclusion may not apply to you. Since some states do not allow limitations on
the length of an implied warranty, the above limitation may not apply to you.

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, WHICH EX-
TEND BEYOND THE DESCRIPTION OF THE FACE HEREOF. THERE IS
NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR A
WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. ADDITION-
ALLY, THIS WARRANTY IS IN LIEU OF ALL OTHER OBLIGATION OR
LIABILITIES ON THE PART OF UPF.

POLY-TANK®, POLYSIDE®, INTEGRATOR™, ELLIPSE™,
ELLIP-T-TANK™ & DEFENDER™ are registered trademarks of UPF, Inc. © 08/01/09 UPF, Inc. Printed in the USA
To keep the UPF tank warranty valid on trucks that have been involved in a vehicular accident, it is UPF's policy that the customer must remove the tank from the truck and send it back to one of UPF's facilities for inspection. In the event that this does not take place, the warranty will be considered null and void.

The customer must remove and send the tank back to UPF for inspection in order to maintain the original warranty coverage, at which time it will be:
- Filled with water
- Visually inspected
- Ultraviolet spark tested on articulating test stand in the dark
- Recommendation for repairs if necessary provided by UPF
- Fully evaluated and repaired by UPF

If your customer chooses to leave the tank on the truck and wants a technician to inspect and/or repair the tank in the field, then the warranty is no longer in effect. This direction is upheld by UPF because the technician cannot inspect the entire tank when it is still installed on the truck.

Note: This memo is intended to relay the information Pierce has received on UPF's tank warranty for trucks that are in a vehicular accident. In the event of an actual claim, we direct you to consult with UPF's service Manager Maura Watts (800-638-8265 x253)
Pierce Manufacturing, Inc. certifies that the GHG17 DD13 Engine as installed in an Enforcer chassis meets the engine installation requirements of the engine manufacturer, the NFPA 1901 and NFPA 1903 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
March 11, 2016

MARCH 4, 2016

Mr. Jon Stage
Pierce Manufacturing, Inc.
3820 American Drive
Appleton, WI 54913-2017

Subject: Vehicle Sign-Off Approval #211550-083
Pierce Enforcer Chassis, GHG17 DD13 Engine

Mr. Stage:

Detroit Diesel has recently completed the review of Vehicle Sign-Off #211550-083. This review covers the use of a DETROIT DD13 engine rated at 520 bhp / 1,050 B1E, model number DMT1 940, in a Pierce Enforcer chassis. This application. The DETROIT DD13 engine rated at 680 bhp / 1,100 B1E and 470 bhp / 1,050 B1E are also included in this review. The results of this review are listed below:

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Niran</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Information</td>
<td>ACCEPTED</td>
<td></td>
</tr>
<tr>
<td>Air Intake System</td>
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<td></td>
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<tr>
<td>Auxiliary Air System</td>
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</tr>
<tr>
<td>Exhaust &amp; Muffler System</td>
<td>ACCEPTED</td>
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<tr>
<td>DEF System</td>
<td>ACCEPTED</td>
<td></td>
</tr>
<tr>
<td>Fuel System</td>
<td>ACCEPTED</td>
<td></td>
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<tr>
<td>Lubrication System</td>
<td>ACCEPTED</td>
<td></td>
</tr>
<tr>
<td>Cooling System</td>
<td>ACCEPTED</td>
<td></td>
</tr>
<tr>
<td>Electrical System</td>
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</tr>
<tr>
<td>Engine &amp; Transmission Mouting</td>
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</tr>
<tr>
<td>On-Board Diagnostics (OBD)</td>
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<td></td>
</tr>
</tbody>
</table>

Please contact me if you have any concerns. Thank you for your cooperation.

Sincerely,

Pete Gajdus
Sr. Application Engineer

Michael Babansky
Manager, Application Engineering
Pierce Manufacturing certifies the performance of the Saber® FR - Enforcer™ 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. The engine speed was maintained at both 1000 and 1400 RPM to simulate both the Cummins engine and Detroit Diesel engine. Both the QP21 and QP31 compressors were tested 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 a maximum of 73.6°F within 30 minutes in all configurations.

VALIDATION TEST: RD2455
Pierce Manufacturing, Inc.

David W. Archer
Vice President of Engineering
Certification Document CD0137
Saber®FR – Enforcer™
Cab Doors

Pierce Manufacturing certifies the integrity of the Saber®FR – Enforcer™ cab doors.

Specimens representing the substantial structural configuration of the Saber®FR – Enforcer™ cab front and crew doors have been successfully tested to meet the following objectives:

OBJECTIVES:
- Survive a 200,000-cycle door slam test with a slam acceleration up to 20 g’s on one representative
- Validate the assembly concept of the main structure of the door by evaluating the durability of the bonding technique.
- Evaluate components, structure, and mounting of the door during and the end of the test for fatigue and failure to ensure durability.
- Verify that the door seals function properly at the end of the test.
- Evaluate the new extrusions and castings of the cab doorframe during and at the end of the test for fatigue, failure, and deformation of seal flanges.
- Evaluate various mounting options for the electronic control module for durability during portions of the slam test.

CONCLUSIONS:
- The door structure and doorframe successfully completed a 200,000-cycle door slam test with a door slam acceleration of 20 g’s.

VALIDATION TEST: RD2425

Pierce Manufacturing, Inc.

David Archer
November 18, 2014
Certification Document CD0133
Saber® FR – Enforcer™
Window Regulators

Pierce Manufacturing certifies the integrity of the Saber® FR – Enforcer™ window regulators.

Specimens representing the substantial structural configuration of the Saber® FR – Enforcer™ window regulators have been successfully tested to meet the following objectives:

**OBJECTIVES:**
- Electric window regulators withstand 30,000 up-down cycles.

**CONCLUSIONS:**
- The electric window regulators withstood 30,000 cycles without failure.

**VALIDATION TEST:** RD2425

Pierce Manufacturing, Inc.

David Archer
Vice President of Engineering
Pierce Manufacturing certifies the performance of the Saber® FR – Enforcer™ cab heat and defroster systems.

The Saber® FR - Enforcer™ 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 SAE prescribed area of the windshield was 100% cleared and the side windows were 75% cleared within the specified 30 minute period.
Defrost Results

Heater:
Heater testing was performed using the coolant supply procedures from SAE J381. The average cab temperature increased 88.3°F from -10°F to 78.3°F within the prescribed 30 minutes. The cab was contained in a cold chamber at -10°F during the duration of the test.

VALIDATION TEST: T5198REP

Pierce Manufacturing, Inc.

David Archer
Vice President of Engineering
Certification Document CD0134
Saber® FR – Enforcer™
Seats and Seat Belts

Pierce Manufacturing certifies the conformance of the Saber® FR – Enforcer™ cab seats and seat belts to Federal Motor Vehicle Safety Standards. Representative Saber® FR – Enforcer™ 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.

VALIDATION TESTS: RD2397

Pierce Manufacturing, Inc.

David Archer
Vice President of Engineering
Pierce Manufacturing certifies the integrity of the Saber® FR – Enforcer™ Windshield Wiper System.

Specimens representing the configuration of the Saber® FR – Enforcer™ 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 wiper linkage, pivots, and mounts successfully completed the 3,000,000 cycles.

VALIDATION TEST: RD2462

Pierce Manufacturing, Inc.

David Archer
Vice President of Engineering
Certification Document CD0130
Saber® FR - Enforcer™
Cab Integrity Certification

Pierce Manufacturing certifies the integrity of the Saber® FR – Enforcer™ cab relative to occupant protection.

A specimen representing the substantial structural configuration of the Saber® FR – Enforcer™ cab models 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 14,253 lb moving barrier was slammed into the side of the cab at 5.25 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.

Frontal Impact: The test cab was struck by the 14,253 lb moving barrier at a speed sufficient to impart the required 32,549 ft-lbs of energy.
Roof Crush: This same test cab was then subjected to a roof crush force of 24,453 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.

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, all doors remain shut, and the cab remained attached to the chassis frame in at least one location. The Pierce cab met all of the Performance Criteria requirements on all 3 integrity tests.

Witnessed and Certified by:

Pierce Manufacturing, Inc.

[Signature]

David Archer
Vice President of Engineering
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.
4.13.1.1 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.

4.13.1.1.1 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 Roll-over 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.

4.13.1.1.2 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.

4.13.1.1.3 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, or 4-m radius device.

4.13.1.1.3.1 For purposes of 4.13.1.1, the apparatus shall be loaded with fuel, firefighting apparatus, hose, ladder, a weight of 250 lb in each seating position, and weight equivalent to the minimum equipment allowance as defined in Table 12.1.2.

4.13.1.1.3.2 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.

4.13.1.1.3.3 The weights added to the fire apparatus for the purpose of testing, calculating, or measurement shall be distributed to approximately 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, as 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 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.

David W. Archer
Director of Engineering
June 03, 2011
SERVICE PHILOSOPHY

Fire & Safety Services Ltd. is the New Jersey sales and service representative for Pierce Manufacturing Inc. of Appleton, WI., the builders of Pierce Fire Apparatus. It is our position that the service given on an apparatus is almost more important than the manufacturer itself. There are many good apparatus manufacturers. What will make the apparatus purchased really beneficial to the owner is the ability to keep the unit in service with a minimum of downtime and for many years to come, frequently 20 or more.

We have set up our organization to give the service after the sale as outlined above. Fire & Safety Services Ltd. has been in business since 1964, with it principal offices and shops originally Piscataway, N.J. but now in South Plainfield, N.J. We have a 15,145 square feet service and parts facility, with spacious fenced yard surrounding the facility. In addition, there is 3,055 square feet of office and administrative space. The property totals about 4 acres.

In addition to service offered at our facility, we offer service on the road with ten service vans and two heavy duty utility body units. Technicians with service vans are stationed strategically throughout the State. Two remaining vans are operated from our South Plainfield location on an as needed basis. A description of the parts carried on the vans and the credentials of the Technicians are listed below.

It has always been our goal to employ persons who in addition to their skills required for our business, serve or have served in the fire service either career or volunteer. Almost all of the people in our sales, service, and parts departments meet these criteria. We feel that the experience with the fire service or in difficult emergency conditions makes people realize the importance of keeping their equipment in top condition and getting repairs completed promptly and the apparatus and equipment back in service. We have a total of 29 persons in our service and parts facilities. Our shop is ASE Blue Seal of Service Excellence certified and employees are EVT certified emergency apparatus Technicians, including ten who are Level III Master Fire Apparatus Technicians. In addition, we were awarded the Pierce Service Organization of the Year award twice.

Our service department is regularly open from 8AM to 4:30PM Monday through Friday with the exception of National Holidays. Our service manager and shop foreman are accessible 24hrs a day via pager and emergency service is available at all times. Routine service work and repairs, which do not place the apparatus out of service, will be performed during regular working hours either at our South Plainfield facility or in your fire station.
SERVICE VAN INVENTORY

Repair kits for Akron, Elkhart, Waterous and Hale valves

1" - 6" cap and swivel gaskets.

2½" - 6" suction inlet strainers, Waterous, Hale, Akron

Waterous and Hale pump component rebuild kits.  (Below is a partial list)
  Relief valve indicator light switches
  Relief valve rebuilding kits
  Pilot valve rebuilding kits
  Engine master governor rebuilding kits.
  Transfer valve overhaul kits.
  Primer pump parts
  Pump packing assorted sizes (all original pump mfg. parts)
  Drain valve parts
  Primer motors

Victaulic gaskets

1" Chicksan swivels

Assorted lubricants for pump transfer cases, ATF, SAE 90 oil, plus oils for Seagrave, American LaFrance, and Bean pumps as required.

Miscellaneous bulbs for running, warning, instrument and other lights.

Miscellaneous size nuts, bolts, washers, lock washers, lock nuts, nuts, cotter pins, etc.

Miscellaneous sized electrical wiring and loom plus terminal connectors

Miscellaneous switches; rocker, toggle, specialized

Miscellaneous solenoids and relays

Service Employees
Sean O'Connor - Service Manager

1983-1985 - Brookdale Community College - Automotive Technology program
1985-1993 - Seagrave dealership - Technician, Parts Manager and later Service Manager
1993-Present - Fire & Safety Services, Ltd., Assistant Service Manager

SCHOOLS

- Waterous Factory Pump Repair
- Pierce Aerial School
- Pierce Electrical Service School
- Pierce Command Zone-Multiplex Electronics
- Zone 2, Command Zone Aerials
- Pierce ABS Brakes
- Allison World Transmissions
- Pierce Foam systems
- Vickers Hydraulics
- Harrison Hydragen
- Service Managers' Seminar
- Service Meetings 2002 through 2016
- Pierce Certification Parts/Policy & Procedure/Warranty
- Pierce Certification Apparatus Delivery Trainer
- Pierce Springboard Parts and Policy
- Pierce PM Training
- Pierce/Fox Valley Annual Chassis Inspection
- Pierce/Fox Valley Annual Inspection Certification Training
- Pierce Ascendant Aerial Systems

OTHER

- EVT Certifications
  - F-1 Maintenance, Inspection & Testing of Fire Apparatus
  - F-2 Design & Performance Standards of Fire Apparatus
  - F-3 Fire Pumps & Accessories
  - F-5 Aerial Fire Apparatus
  - F-6 Allison Automatic Transmissions
- ASE Master Medium/Heavy Duty Truck Technician
  - Diesel Engines
  - Drive Train
  - Brakes
- Electrical / Electronic Systems
- 2006 Pierce Service Technician of the Year
- Exceptional service seminar 2010
  - South Amboy Fire Department (Protection Engine Company)
Ed Reagan- Service Writer

1985-1993- Blackstone Lumber- Fleet Mechanic
1993-1998- Campbell Supply (Seagrave)
1998-2000- Transaxle Corporation
2000-2006- Seagrave Sales & Service (Operations Manager)
2006-Present- Fire & Safety Services Ltd.

SCHOOLS

- Lincoln Tech., Automotive and Diesel Technology
- Middlesex County College, Business Management
- Pierce Springboard Parts and Policy
- Pierce customer service
- Foundation brake seminar 2010
- Exceptional service seminar 2010

OTHER

- EVT Master Technician Level III
  - F-1 Maintenance, Inspection & Testing of Fire Apparatus
  - F-3 Fire Pumps and Accessories
  - F-4 Fire Apparatus Electrical Systems
  - F-5 Aerial Fire Apparatus
  - F-6 Allison Automatic Transmissions
- EVT- Management Level I
- ASE – Master Truck Technician
- ASE HD Truck dealer parts
- ASE HD After-market parts
- ASE Truck equipment installation & repair
- ASE Mastertruck equipment spec.
- Pierce Ascendant Aerial Systems
- Sayreville Fire Department
  - Melrose Hose Company (Exempt member)

Peter Esemplare- Service Writer

1997-1998-Central Jersey Freightliner
1994-2013-Maple Crest Lincoln/Mercury
2013-Present- Fire & Safety Services Ltd.

SCHOOLS

- Hudson County Community College

OTHER

- EVT Certifications
  - F1- Inspection Maintenance and Testing
  - F2- Design and Performance
- Mountainside Volunteer Fire Department
  - Chief 2010-2013
- Union County Arson Task Force 1991- Present
- International Association of Arson Investigators 1992- Present
- TWIC- Transportation Worker Identification Credential
- Pierce Ascendant Aerial Systems

John Thompson- Asst. Service Manager
SCHOOLS

- **Brookdale Community College**
  - Associates in Applied Sciences

OTHER

- EVT Level I Fire Apparatus Technician
- EVT Level II Fire Apparatus Technician
- EVT Master Fire Apparatus Technician
  - F1 Maintenance Inspection & Testing of Fire Apparatus
  - F2 Design & Performance Standards of Fire Apparatus
  - F3 Fire Pumps & Accessories
  - F4 Fire Apparatus Electrical Systems
  - F5 Aerial Fire Apparatus
  - F6 Allison Automatic Transmissions
- EVT Management Level I Supervisor
- ASE- Master Medium/Heavy Truck Technician
  - T1 Truck Gasoline Engines
  - T2 Truck Diesel Engines
  - T3 Truck Drive Train
  - T4 Truck Brakes
  - T5 Truck Suspension & Steering
  - T6 Truck Electrical System
  - T7 Heating & Air Conditioning
  - T8 Preventative Maintenance Inspections
- ASE- Master Truck Equipment Technician
  - Truck Equipment Installation & Repair
- Certified American LaFrance Service Professional
- Spartan Chassis Technical Training
- Harrison Hydraulic Generators
- LTI Aerial Service & Repair
- Class 1 Multiplexed Vehicle Electrical Systems
- Waterous Pump School
- Hale Pump School
- Interstate Batteries Heavy Duty Truck /Equipment ProClinic
- Seagrave Aerial Ladder Training
- Seagrave Service Training
- Arvin Meritor S-Cam Foundation Air Brake
- Pierce Ascendant Aerial Systems
Robert Zelehoski- Parts Manager

1993-2001- Campbell Supply
2001-2014- Seagrave Sales & Service LLC
2015-2016- First Priority Emergency Vehicles
2016-Present- Fire & Safety Services Ltd.

SCHOOLS

- Bendix Air Brakes
- Waterous Factory Pump School
- Pierce Parts
- Pierce Ascendant Aerial Systems

OTHER

- EVT
  - F1 Maintenance Inspection & Testing of Fire Apparatus
  - F2 Design & Performance Standards of Fire Apparatus
  - F3 Fire Pumps & Accessories
- East Brunswick Independent Fire Company
  - Chief (ret.)

Neil Matthaey- Parts Coordinator

2000-Present- Fire & Safety Services Ltd., Parts Bulk Purchaser

OTHER

- Chevy parts
- Matawan Fire Department

Lawrence Longobardi- Internal Parts Coordinator

2003-2004- Tire Lube Express
2004-2005- Good Year Gemini
2005-2010- Mikes Hot & Cool
2011-2015- Pep Boys
2016-Present- Fire & Safety Services Ltd.

SCHOOLS

- Lincoln Technical School
- Bendix Air Brakes
- Pierce Ascendant Aerial Systems

OTHER

- EVT Level 1
  - F1 Maintenance Inspection & Testing of Fire Apparatus
  - F2 Design & Performance Standards of Fire Apparatus

- ASE Certifications
  - T4 Truck Brakes
  - T5 Truck Suspension & Steering
Michael Lorenson - Shop Foreman

1974-1982 - Academy Bus Lines - Mechanic
1982-1990 - Boro Buses Co. - Bus and fire apparatus repairs, specializing in air conditioning and electrical repairs and installations.
1990-Present - Fire & Safety Services Ltd.

SCHOOLS
- Baker Engineering-AerialScope maintenance & repair
- Brookdale College & Technical school courses in Air Conditioning, electric motor & control circuits and electrical theory
- General Motors-Automatic Transmissions
- Waterous Factory Pump Repair and Service School
- LTI Aerial Maintenance & Repair School
- Detroit Diesel/Allison - Electronically controlled engines and transmissions
- Pierce Micro Controllers
- Pierce Aerial Devices
- Allison World Transmissions
- Amps Generators
- Pierce Command Zone I, Pierce Command Zone II with D module training
- Skyarm and Skyboom products
- Meritor ABS brakes
- Akron Valves
- Vickers Hydraulics
- Harrison Hydragen
- Pierce Certification Apparatus Delivery Trainer
- Pierce TAK 4 Suspension
- Pierce Frontal & Side Roll Protection
- Pierce Foam Systems
- Pierce Air Conditioning
- Foundation brake seminar 2010
- Pierce Master Technician
- Pierce Bronto Maintenance
- Pierce Advanced Aerial training
- Pierce Ascendant Aerial Systems

OTHER
- EVT Level III Fire Master Apparatus Technician
- ASE Master Medium/Heavy Duty Truck Technician
- ASE Electronic Diesel Engine
- Advanced Member NAEVT,
- Pierce Master Technician
- EVT Evaluation Committee - 1995-2000
- Pierce East Region Service Technician of the Year - 2015

Service Information - Updated 6-3-2019
Ken Maser: Technician

1971-1976-Brockway Trucks
1981-1986-Mack Distributor, heavy truck mechanic, and became mechanic for fire apparatus division.
1986-Present- Fire & Safety Services, Ltd.

SCHOOLS

- Cummins Service School
- Mack schools: basic diesel engine, advanced engine, driveline, Waterous pumps Baker Engineering-AerialScope service & repair
- LTI-aerial maintenance and repair school
- Waterous-Factory pump repair and service school
- Snorkel service and repair school
- Detroit Diesel/Allison Transmission - electrically controls for transmissions and engines
- Pierce Micro Controllers
- Pierce Aerial Devices
- Yanmar Diesel Engines
- Pierce Air Systems
- Allison World Transmission
- Pierce Command Zone-Multiplex electronics
- Meritor ABS Brakes
- Akron Valves
- Skyarm-Skyboom
- Harrison Generator
- Pierce Aerial CZII
- Pierce Certification Apparatus Delivery Trainer
- Pierce Service Meeting 2006
- Pierce Foam Systems Maintenance
- Pierce Bronto Maintenance
- Pierce Ascendant Aerial Systems

OTHER

- Graduate-Engine City Tech
- EVT
  F3 Fire Pumps & Accessories
  F4 Fire Apparatus Electrical Systems
  F5 Aerial Fire Apparatus
  F6 Allison Automatic Transmissions
William Stagg, Jr.- Technician

1979-1980- American LaFrance
1980-1989- Bergen County DPW
1989-1994- Absolute, Community & Defender Fire Equipment
1995-Present- Fire & Safety Services, Ltd.

SCHOOLS

- Lincoln Tech- Diesel Engine and Drive Train
- Engine City Tech-Diesel Engine and Drive Train
- American LaFrance Factory Pump Service and Repair School
- Hale Factory Pump Service and Repair School
- Waterous Pumps
- Emergency One Schools-ATEC, DDEC, Air Brakes, Aerials, Electrical
- Pierce Aerial School
- Meritor Brakes
- Vickers Hydraulics
- Harrison Hydragen
- Foundation brake seminar 2010
- Allison transmission seminar 2010
- Pierce Ascendant Aerial Systems

OTHER

- ASE Brakes / Steering and Suspension / Drive Train
- EVT-Design
- NAEVT-charter member
John Bonino - Technician

1985-1997 - Vespi's Goodyear Automotive, Technician
1997-Present - Fire & Safety Services, Ltd.

SCHOOLS

- Lincoln Tech Automotive Tech-1985 Graduate
- Meritor ABS brakes
- Pierce electrical
- Pierce Aerial
- Waterous Pumps
- Vickers Hydraulics
- Harrison Hydragen
- Foundation brake seminar
- Pierce Ascendant Aerial Systems

OTHER

- ASE Master HD Truck Technician
- EVT Level III Master Fire Apparatus Technician
- Volunteer Firefighter, Woodbridge Township Fire District #9 (Iselin) 1995-1996
Allen Dean - Technician

1984-1994- Campbell Supply (Seagrave Dealer), Technician
1994-1995- Fire & Safety Services Ltd. (Full Time), Technician
1995-2002- Fire Safety Services Ltd. (Part-time), Technician
1995-2003- Cherry Hill Fire District #13- Fire Department Apparatus Repair Shop, Technician
2003-Present- Fire & Safety Services, Ltd.

SCHOOLS

- Hale
- Waterous
- Pierce Electrical
- Pierce Aerial CZII
- Pierce CAFS and Husky Foam systems
- Pierce Ascendant Aerial Systems

OTHER

- EVT- Level III, Master Fire Apparatus Technician
  - F-1 Maintenance, Inspection, & Testing of Fire Apparatus
  - F-2 Design & Performance Standards of Fire Apparatus
  - F-3 Fire Pumps & Accessories
  - F-4 Fire Apparatus Electrical Systems
  - F-5 Aerial Fire Apparatus
  - F-6 Allison Automatic Transmissions
- Master ASE Medium/Heavy Duty Truck Technician
  - T-2 Diesel Engines
  - T-3 Drive Train
  - T-4 Brakes
  - T-5 Suspension and Steering
  - T-6 Electrical / Electronic Systems
  - T-7 Heating, Ventilation, and AC

- Pierce Certified Apparatus Delivery Trainer
- Service Meeting 2004
- Pierce Bronto Maintenance
- Falls Twp. (Pa) Fire Company #1
  - Past Deputy Fire Chief
- Northampton Borough (Pa) Fire Department
  - Past Assistant Fire Chief
- Cherry Hill Fire District #4
  - Per Diem Firefighter 1990-1995
Barry Applegate - Technician

1983-1985 - Fleet Repair and Maintenance, Technician
1985-1993 - Sears Auto Center, Tech 4
1993-2001 - Penske Auto Center, Crew Chief
2001 - Present - Fire & Safety Services, Ltd.

SCHOOLS

- Pierce Chassis Electrical
- Pierce Service Meeting 2005
- Pierce Apparatus Delivery Trainer
- Foundation brake seminar 2009
- Pierce SRP training
- Pierce Aerial training
- Pierce Command Zone II training
- Pierce CAFS / Husky training
- Pierce TAK-4 training
- Hale Pump School
- Waterous Pump School
- Pierce Heating, Ventilation and Air Conditioning
- Pierce Command Zone III Training
- Pierce Ascendant Aerial Systems

OTHER

- ASE-HD Truck Brakes
  - Heating and Air Conditioning
  - Steering and Suspension/Preventative Maintenance
  - Auto Steering and Suspension
  - Brakes
  - Electrical systems

- EVT-Level I
  - Design and Performance of Fire Apparatus
  - Fire Pumps and Accessories
  - Fire Apparatus electric.
1998-2000: Seagrave Dealer
2005-2006: Seagrave Sales & Service
2006-Present: Fire and Safety Services Ltd.

SCHOOLS
- Harrison Hydra-Gen
- Waterous
- Hale
- LTI-Aerials
- Pierce Aerials
- Pierce CAFS and Husky Foam systems
- Service Meeting 2003
- Pierce Ascendant Aerial Systems

OTHER
- ASE –
  - Heavy Duty Brakes
  - Electrical, Preventative Maintenance
  - Diesel Engines / Drivetrain
  - Heating and A/C
  - Steering & Suspension
  - Foundation brake seminar
  - Allison Transmission seminar
- EVT
  - F-3 Fire Pumps & Accessories
- Milltown Fire Department
  - Engineer
  - Captain

Don McNeany - Technician
1979-2000: Frank’s Automotive – Automotive Body Work, Front End, Electrical and Mechanical

Service Information- Updated 6-3-2019
2007-Present  Fire & Safety Services Ltd.

SCHOOLS

- Pierce Service meeting 2008
- Pierce Chassis electrical
- Foundation brake seminar
- Pierce Ascendant Aerial Systems

OTHER

- I-Car Auto Body Certificate

Matt McNeany - Technician

2007-Present  Fire & Safety Services, Ltd., Technician

SCHOOLS

- East Brunswick Vo-Tech 4 years Heating and Air Conditioning
- Pierce Aerial Maintenance
- Pierce Air Conditioning Maintenance
- Hale Pump School
- Pierce Chassis Electrical
- PUC Maintenance Class
- Command Zone Class
- Pierce Ascendant Aerial Systems
Richard Raimo: Technician

2001-2003- Seagrave Fire Apparatus
2004-2005- TFI Fleet Maintenance
2007- Present- Fire & Safety Services Ltd

SCHOOLS

- Darley Pump School
- Waterous Pump School
- Oshkosh FMTV Training
- Pierce TAK-4 ste reng & suspension
- Bendix Brake School
- Pierce Ascendant Aerial Systems

OTHER

- EVT Level III, Master Fire Truck Technician
  - F1 Maintenance Inspection & Testing of Fire Apparatus
  - F2 Design & Performance Standards of Fire Apparatus
  - F3 Fire Pumps & Accessories
  - F4 Fire Apparatus Electrical Systems
  - FA-4 Advanced Electrical Systems
  - F5 Aerial Fire Apparatus
  - F6 Allison Automatic Transmissions
  - F8 Hydraulic Systems

- ASE Certifications
  - T1 Truck Gasoline Engines
  - T2 Truck Diesel Engines
  - T3 Truck Drive Train
  - T4 Truck Brakes
  - T5 Truck Suspension & Steering
  - T6 Truck Electrical System
  - T7 Heating & Air Conditioning
  - T8 Preventative Maintenance Inspections

- EPA-609, Motor Vehicle Air Conditioning Certification
Andrew Drzdzowski- Technician

2004-2005- Campbell Supply
2005-2008- Seagrave Sales & Service
2008- Present- Fire & Safety Services Ltd.

SCHOOLS

• East Brunswick High School and Vo-Tech
• Engine City Tech
• Harrison Generator
• Truck A/C
• Pierce Service Meeting 2008
• Pierce Air Conditioning Maintenance
• Pierce Command Zone II Training
• Pierce TAK-4 training
• Pierce air brake service
• Pierce CAFS / HUSKY training
• Pierce SRP training
• Foundation brake seminar
• Oshkosh TPV maintenance
• Pierce Bronto Maintenance
• Pierce Ascendant Aerial Systems

OTHER

• EVT—Level II Master Technician
  o F1 Maintenance Inspection & Testing of Fire Apparatus
  o F2 Design & Performance Standards of Fire Apparatus
  o F3 Fire Pumps & Accessories
  o F4 Fire Apparatus Electrical Systems
  o FA-4 Advanced Electrical Systems
  o F5 Aerial Fire Apparatus
  o F6 Allison Automatic Transmissions
  o Foam systems
• ASE—Master Heavy Duty Truck Technician
• East Brunswick Fire District No. 1 (Old Bridge Fire Company)
  o Chief of Department
Paris Aguirre - Technician

1996-1999 - Jeff's Auto Repair
2006-Present - Detailing-n-Accessories (Owner)
2011-Present - Fire & Safety Services, Ltd.

SCHOOLS

- Bendix Brakes
- Trans Axle
- Air Conditioning
- Waterous Pump School
- Hale / Class 1 Pump School
- Pierce Chassis Electrical
- Pierce Service meeting 2013
- Pierce Ascendant Aerial Systems

OTHER

- Ridgeway Volunteer Fire Company
  - Member
Frank Dy- Technician

2003-2005- Advanced Auto Parts
2005-2009- STS Tire & Auto Center
2013- Present- Fire & Safety Services Ltd.

SCHOOLS

- Waterous Pumps, Factory Training
- Bendix Brake School
- Pierce- Heating, Ventilation and Air Conditioning
- Pierce Command Zone III Training
- Pierce Ascendant Aerial Systems

OTHER

- EVT Level 1 Fire Apparatus Technician
  - F1 Maintenance Inspection & Testing of Fire Apparatus
  - F2 Design & Performance Standards of Fire Apparatus
  - F3 Fire Pumps & Accessories
  - F4 Fire Apparatus Electrical Systems

- ASE Certifications
  - T4 Truck Brakes
  - T5 Truck Suspension & Steering
  - T6 Truck Electrical System

- Rutgers University- Bachelor's Degree in Computer Science
- Metuchen Fire Department
  - Chief Engineer
  - Captain
  - Truck Committee member- 2014 Pierce Saber Pumper
Matthew Forsthoffer

2004-2005 - Sears Auto Center
2009-2009 - Woodbridge Machine & Tool
2003-2014 - Pauls Complete Auto Repair
2011-2014 - Pep Boys
2014- Present - Fire & Safety Services Ltd.

SCHOOLS

- Middlesex County College
- Pierce chassis electrical
- PUC Maintenance
- Bendix Brake Systems
- Hale Pump School
- Pierce Ascendant Aerial Systems

OTHER

- EVT Certifications
  - FI Maintenance Inspection & Testing of Fire Apparatus
- ASE Certifications
  - Automotive Steering & Suspension
  - Brakes
Lewis Letts- Technician

2005-2005- Johnson & Towers
2006-2007- First Priority Emergency Vehicles
2007-2008- VCI Emergency Vehicle Specialists
2010-2015- Northeast Metro Ambulance
2015-Present- Fire & Safety Services, Ltd

SCHOOLS

- Ohio Technical College- Diesel & Automotive Master Technician
- MACS Air Conditioning Certified
- Hale Pump Maintenance & Operations
- Workhorse Chassis Certified
- Pierce Ascendant Aerial Systems

OTHER

- EVT Certifications
  - F1 Maintenance Inspection & Testing of Fire Apparatus
  - F2 Design & Performance Standards of Fire Apparatus
  - F3 Fire Pumps & Accessories
  - F4 Fire Apparatus Electrical Systems
  - F5 Aerial Fire Apparatus
  - F6 Allison Automatic Transmission
- ASE Certifications
  - T2 Truck Diesel Engines
  - T4 Truck Brakes
  - T6 Truck Electrical System
- Emergency Medical Technician
  - Beach Haven First Aid Squad
    - Past Captain
- Beach Haven Volunteer Fire Company
  - Past Captain
- West Tuckerton Fire Company
Michael Hatroock

2010-2010-Richard Brown Electrical Contractor
2011-2014-Oliver Fire Protection
2015-2017-Fire & Safety Services Ltd.
2017-2018-Premium Fire & Security
2018-Present- Fire & Safety Services Ltd.

SCHOOLS
- Pierce- Chassis Electrical
- Pierce Ascendant Aerial Systems

OTHER
- Bucks County Technical HS- Electronics / Communications
- PENNCO Tech- Electrical Program graduate
- Mobile Electronics Certified Professional- Certified Electronic TECH- Certifications
- EVT
  o F1 Maintenance Inspection & Testing of Fire Apparatus
  o F2 Design & Performance Standards of Fire Apparatus
  o F4 Fire Apparatus Electrical Systems

Doug Day- Technician

2002 – 2004-NAPA Auto Parts
2004 – 2012-Self Employed
2013 - 2015-Hunterdon County Corrections
2016 – 2018-Boni Tire
2018 – Present- Fire & Safety Services, Ltd.

SCHOOLS
- Lincoln Tech, Automotive Services
- Pierce Chassis Electrical
- Pierce Husky 3 Foam System
- Pierce Husky 12 Foam System
- Waterous Pump Training
- Pierce Ascendant Ladders

OTHER
- EVT Certifications
  o F1 Maintenance Inspection & Testing of Fire Apparatus
  o F3 Fire Pumps & Accessories
- Mac’s Air Conditioning Certified
- Raritan Township Fire Company
  o Chief of Department (ret.)
Patrick O'Brien - Technician
2012-2014 - Maintainco
2019-Present - Fire & Safety Services Ltd.

SCHOOLS
- Universal Technical Institute (UTI) Graduated 2012
- Pierce Ascendant Aerial Systems

OTHER
- Member Cliffwood Fire Department since 2012
  - Fire Official & inspector Certifications since 2014

Christopher Verdino - Technician
2019 - Fire & Safety Services Ltd.

SCHOOLS
- Graduate - Lincoln Technical Institute Graduated 2019
  - ASE Certified - Nonstructural repair and painting
- Pierce Ascendant Aerial Systems

OTHER
- Member - Rutherford Fire Department - Eng. Co. #2
  - Firefighter 1 & Firefighter 2
**Tucker Harding - Fabricator**

2004-2009 - Rennen Performance
2010-2015 - First Priority Emergency Vehicles
2016-Present - Fire & Safety Services Ltd.

**SCHOOLS**

- Fierce certified welder / fabricator
- AWS certified welder
- CWI certified welder
- Pierce Ascendant Aerial Systems

**OTHER**

- Lebanon Borough Fire Company, serving since 2007
  - Captain

**Robert Hanley Jr. - Fabrication Technician**

2015-2015 - First Priority Emergency Vehicles
2016-Present - Fire & Safety Services Ltd.

**SCHOOLS**

- Pierce Ascendant Aerial Systems

**OTHER**

- New Jersey Certified Level II Fire Instructor - Since 2010
- Kingwood Township Volunteer Fire Company - Since 2003
  - Fire Chief

**Cole Logan - Fabrication Technician**

2012-2015 - Pierce-Eagle Equipment Company
2015-2017 - Banker Steel N.J. LLC
2017-2018 - A&J Enterprises
2018-2019 - Custom Welding Inc.

**SCHOOLS**

- Pierce Ascendant Aerial Systems

**OTHER**

OSHA certified forklift operator
PART TIME TECHNICIANS

Derek Kraese, Technician

1998-2000- Loman Ford
2002-Present- Fire & Safety Services, Ltd.

SCHOOLS

- Various Ford Schools
- Middlesex County College-Ford Asset Training
- Vickers Hydraulic
- Harrison Generator

OTHER

- ASE Master Automotive Technician
  - ASE Heavy Duty Truck
  - Brakes
  - Electric
  - Steering & Suspension
  - Heat & A/C
  - Preventative Maintenance

- EVT – Level I
- Perth Amboy Fire Dept.- Career Firefighter

Thomas Wilson, Technician

1985-2016- New Jersey Transit
2016-Present- Fire & Safety Services, Ltd.

SCHOOLS

- Electrical Training Parts I & II
- Air Conditioning Certified
- Allison Transmission Training
- DDEC 1 & II Training
- Smoke Check 1667 Emission testing certified
- Pierce Ascendant Aerial Systems

OTHER

- EVT
  - F1 Maintenance Inspection & Testing of Fire Apparatus
- Washington Township Fire Department
  - Ex-Chief
Duane Gilmartin - Technician

2010—Present- Fire & Safety Services, Ltd.

SCHOOLS

- Lincoln Technical Institute
- Pierce Ascendant Aerial Systems

OTHER

- Jersey City Fire Department, Career Firefighter (Retired)

Gregory Sadowski Jr.

2001- Present- US Coast Guard
2006-2007- Mid Atlantic Truck Center
2007- Campbell Supply
2012- Present- Elizabeth Fire Department
2015-2016- Cambria Mack-Peterbilt
2016-2019- Sisbarro Fleet Services
2019- Present- Fire & Safety Services

SCHOOLS

- Engine City Technical Institute (Graduated)
- Pierce Ascendant Aerial Systems

OTHER

- US Coast Guard- Chief
- Elizabeth Fire Department-HazMat Technician
FIRE & SAFETY SERVICES, LTD.
200 Ryan Street
South Plainfield, NJ 07080

Front Entrance and Visitor Parking Area

Rear of Shop from Apparatus Parking Area

Main Shop Area

Additional Service Space
Service Facility Can Accommodate 13 Trucks Indoors

For more information about our facility or our services, please call or stop by our South Plainfield location.