

To: Emmet County Finance Department  
PELLSTON REGIONAL AIRPORT  
200 Division Street, Suite G70  
Petoskey, MI 49770

Date: May 27, 2022

We hereby propose and agree to furnish, after your acceptance of this proposal and the proper execution by the Pellston Regional Airport, hereinafter called the Buyer and an officer of Rosenbauer Minnesota, LLC, hereinafter called the Company, the following apparatus and equipment.

One (1) Rosenbauer Panther 4x4 Apparatus Body	\$721,063.00
Gross due upon completion and delivery Total	\$721,063.00*

Seven Hundred Twenty-One Thousand Sixty-Three Dollars\*  
\*\*DOES NOT INCLUDE TAX, BID VALID FOR 90 DAYS\*\*

All of which are to be built in accordance with the specifications, clarifications and exceptions attached, and which are made a part of this agreement and contract.

**DELIVERY:** The estimated delivery time for the completed apparatus, is to be made 425 days after receipt of and approval of this contract duly executed, (chassis and (or) major components must arrive within 150 days or delivery may be extended), subject to all causes beyond the Company's control. The quoted delivery time is based upon our receipt of the approved specifications within 60 days of contract signing. A \$100.00 per working day penalty will apply if the completed vehicle is not delivered within the number of days set forth above, amended for late receipt of approved production specifications, vendor delays and any Change Order delays. "Delivery" means the date company is prepared to make physical possession of vehicle available to the customer.

**CONTRACT CHANGES:** After execution and acceptance of this Contract, the Buyer may request that the Company incorporate a change to the Products or the Specifications for the Products by delivering a Change Order to the Company; provided, however, that any such Change Order must be in writing and include a description of the proposed change sufficient to permit the Company to evaluate the feasibility of such Change Order. Within seven (7) working days of receipt of a Change Order, the Company will inform the Buyer in writing of the feasibility of the Change Order, the earliest possible implementation date for the Change Order, of any increase or decrease in the Purchase Price resulting from such Change Order, and of any effect on production scheduling or delivery resulting from such Change Order. The Company shall not be liable to the Buyer for any delay in performance or delivery arising from any such Change Order. Purchase Price may be modified only by mutual written agreement of the Parties because of changes to the Apparatus required or requested by the Buyer during the construction process pursuant to Appendix C, Change Order Policy. Any changes in the Purchase Price resulting from changes to the Apparatus required or requested by the Buyer during the construction process shall be stated in the Change Order signed by both parties. Additional Changes: If various state or federal regulatory agencies (e.g. NFPA, DOT, EPA) require changes to the specification and/or the product that result in a cost increase to comply therewith this cost will be added to the Purchase Price to be paid by the customer.

**FORCE MAJEURE:** The Company shall not be responsible nor deemed to be in default on account of delays in performance due to causes which are beyond the Company's control which make the Company's performance impracticable, including but not limited to civil wars, insurrections, strikes, riots, fires, storms, floods, other acts of nature, explosions, earthquakes, accidents, any act of government, delays in transportation, inability to obtain necessary labor supplies or manufacturing facilities, allocation regulations or orders affecting materials, equipment, facilities or completed products, failure to obtain any required license or certificates, acts of God or the public enemy or terrorism, failure of transportation, epidemics, quarantine restrictions, failure of vendors (due to causes similar to those within the scope of this clause) to perform their contracts or labor troubles causing cessation, slowdown, or interruption of work.

**PAYMENT TERMS:** Final payment for the apparatus shall be made at time of delivery or pick up of the completed vehicle. It is the responsibility of the Buyer to have full payment ready when the apparatus is complete and ready to deliver. If payment is delayed or delivery is delayed pending payment, a daily finance and storage fee may apply. Upon delivery of the apparatus or upon pickup of the apparatus by the Buyer, the Buyer agrees to provide all liability and physical damage insurance. It is further agreed that if on delivery and testing, any defects should develop, the Company shall be given reasonable time to correct changes. Guarantee of the chassis is subject to the guarantee of the chassis manufacturer. \*NOTE: upon final inspection at the factory for pick-up or delivery, the Buyer will need to supply a Certificate of Insurance and full payment prior to release of the vehicle, unless prior arrangements for vehicle's release have been made.

**TITLE:** The Apparatus shall always be the property of the Company until it is delivered to the Buyer pursuant to the terms of this agreement. The Company shall bear the sole responsibility and risk for destruction, loss or damage to the apparatus, or any portion of the Apparatus, through the date and time it is delivered to the Buyer. The Company shall deliver good and merchantable title to the Apparatus at the time it is delivered to the Buyer. The Buyer shall bear the sole responsibility and risk for destruction, loss or damage to the Apparatus upon the date and time it takes delivery of the Apparatus.

[www.rosenbaueramerica.com](http://www.rosenbaueramerica.com)

[info@rosenbaueramerica.com](mailto:info@rosenbaueramerica.com)

ROSENBAUER SOUTH DAKOTA, LLC.  
100 THIRD STREET  
P.O. BOX 57  
LYONS, SOUTH DAKOTA 57041  
P: 605.543.5591

ROSENBAUER MINNESOTA, LLC.  
5181 260TH STREET  
P.O. BOX 549  
WYOMING, MINNESOTA 55092  
P: 651.462.1000

ROSENBAUER MOTORS, LLC.  
5190 260TH STREET  
P.O. BOX 549  
WYOMING, MINNESOTA 55092  
P: 651.462.1000

ROSENBAUER AERIALS, LLC.  
870 SOUTH BROAD STREET  
FREMONT, NEBRASKA 68025  
P: 402.721.7622

**PIGGY BACK ORDERS:** The Company, at its sole discretion, will allow the terms of the contract to be extended to both the Buyer, as well as to other Municipal, State, or Federal agencies for similar unit(s). The Company will allow tag on / additional orders for up to three (3) years from the date of contract execution. To facilitate pricing, the Company will quote the original price plus manufacturer's price increases or Producer's Price Index (PPI) whichever is greater as it applies to either Fire Apparatus and/ or commercial heavy truck industries.

**MISCELLANEOUS PROVISIONS:** This agreement shall be construed in accordance with the laws of the State of Minnesota. The parties agree that any litigation arising from or in connection with any dispute between the parties under this agreement shall be venue in Minnesota. The parties agree that this agreement bears a rational relationship to the State of Minnesota, and they consent to the personal jurisdiction of such state and further consent and stipulate to venue in the above described court.

Respectfully submitted,

**DEALER:** DUANE KANN

**BUYER:**

We accept the above proposal and enter into contract with signature below.

\_\_\_\_\_ Title \_\_\_\_\_

\_\_\_\_\_ Title \_\_\_\_\_

\_\_\_\_\_ Date \_\_\_\_\_

*After company receipt of this document signed by the Buyer, the document will be reviewed and upon approval, countersigned by the Company thereby putting the document in force.*

**ROSENBAUER MINNESOTA, LLC**

State or Organization – Delaware 4/18/1995



Randy Brummel – GM/VP

651-462-1000 / [rbrummel@rosenbaueramerica.com](mailto:rbrummel@rosenbaueramerica.com)

5181 260<sup>th</sup> Street/ Wyoming, MN 55092

Date: May 27, 2022

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## APPENDIX C CHANGE ORDER POLICY

This change order policy is intended to reflect the increased cost of changes which result in delayed deliveries, confused paperwork, poor production flow and increased potential of trucks being built to incorrect specifications. With your cooperation, changes can be kept to a minimum which means we will be able to reduce lead times, increase production and maintain costs which will benefit all of us.

Our objective is accurate, high quality and on-time deliveries exceeding our customer expectations.

Changes any time after the order is received may delay the quoted delivery date. Significant design or component changes will have the largest impact on the schedule and quoted delivery date. Changes that occur later in the process will also have the largest impact on the schedule and quoted delivery date.

All time fences are reference to contract execution date if not otherwise stated.

### Change Window #1

All changes will be priced at standard pricing and specials will be priced through our normal process. Significant changes made to the vehicle during this time period may result in a delivery extension.

RBM Chassis	0-60 days
RBA Aerial	0-60 days
Rosenbauer Body	0-60 days

### Change Window #2

All changes are subject to a 25% mark-up, as well as a \$250.00 change order processing fee. All changes are subject to factory review and may be denied due to engineering or lead time issues.

RBM Chassis	61-75 days
RBA Aerial	61-75 days
Rosenbauer Body	61-120 days

### Change Window #3

All changes are subject to a 50% mark-up, and 50% restocking fee on deleted items, as well as a \$250.00 change order processing fee. All changes are subject to factory review and may be denied due to engineering or lead time issues. No major components can be changed at this time; major components are considered engine, transmission, axles, suspension, cab, frame (wheelbase), seats, water pump and water tank.

RBM Chassis	76-120 days
RBA Aerial	76-120 days
Rosenbauer Body	121-180 days

### Change Window #4

Changes are not recommended at this time. Any changes requested will be priced on a time and material basis, as well as a \$500.00 change order processing fee. Any changes requested, and that are quoted to the customer, must be approved by the customer within three days or they will not be valid.

RBM Chassis	After 120 days
RBA Aerial	After 120 days
Rosenbauer Body	After 180 days

*\*Note: Any late change orders that are factory driven will be done at cost and no additional mark up or penalties will apply.*

Initials \_\_\_\_\_

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[info@rosenbaueramerica.com](mailto:info@rosenbaueramerica.com)

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**-- CONFIDENTIAL --**  
**NOT SUBJECT TO DISCLOSURE UNDER EXEMPTION # 4**  
**OF THE FREEDOM OF INFORMATION ACT**

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**Buy American Preferences – Final Assembly Questionnaire**

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To assist the Federal Aviation Administration (FAA) in making the determination of whether final assembly of the product occurs in the United States, please complete and submit this questionnaire when requesting a Buy American Waiver under 49 USC § 50101(b)(3)(A).

Company Name: Rosenbauer Minnesota, LLC

Date: 06/03/2022

FAA Eligible Item: ARFF Vehicle-Model A144

FAA Item Number (if applicable):

Address of Final Assembly Location: Rosenbauer Minnesota, 5240 257th St., Wyoming, Minnesota, 55092 USA

1. Provide a description of the assembly process occurring at the specified final location in the United States.
  - a. Describe the final assembly process and its various operations.

The final assembly of the Panther ARFF Vehicle takes place in Rosenbauer Minnesota's building #7 located in Wyoming, MN. The process consist of mounting the completed component assemblies of the cab, pump module, water tank and engine module onto the chassis running gear.
  - b. How long does the final assembly process take to complete?

Three weeks
2. Provide a description of the resources used to conduct the assembly of the product at the specified location in the United States.
  - a. How many employees are involved in the final assembly process and what is the general skill level of those employees?

12 Final assemblers with various skills including; light fabrication, electrical and plumbing
  - b. What type of equipment is used during the final assembly process?

overhead crane, misc. hand tools, electric & pneumatic power tools, iron worker for light fabrication.
  - c. What is a rough estimate of the associated cost to conduct final assembly of the product at the specified location in the United States?

total cost \$597,919.00 w/final assembly hr

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The undersigned certifies that this information is true and accurate to the best of their knowledge. A false certification represents a violation of 18 U.S.C § 1001 and 49 U.S.C § 47126. Signatory has the burden of proof to establish compliance.

Signature: \_\_\_\_\_



Name: Randy Brummel- GM/VP

# AFFIDAVIT OF AUTHORITY

TO SIGN FOR A COMPANY OR CORPORATION



## Authorized Signature Certification

I, Rob Kreikemeier, do hereby certify that I am the C.E.O. of Rosenbauer America, LLC and the following is a true copy of the resolution adopted by the board of directors of Rosenbauer Minnesota. I do hereby further certify that said resolution remains in full force and effect as of the date hereof:

Be it resolved that the following officers and employees are authorized to sign bid bonds, bid proposals, performance bonds and contracts related to such bid proposal on behalf of the company.

Rob Kreikemeier – C.E.O., Rosenbauer America, LLC  
Randy Brummel – GM / VP, Rosenbauer Motors, LLC

That said bid bonds, bid proposals, performance bonds and contracts is within the scope of its corporate powers and was duly signed for and on behalf of Rosenbauer Minnesota, LLC by authority of its governing body, as evidenced by the attached true and correct copy of the Board Member Resolution.

## Board Member Resolution

I, Rob Kreikemeier, do hereby certify that I am the C.E.O. of the Limited Liability Company named herein; that a meeting of the Board of Directors of Rosenbauer Minnesota, LLC, a subsidiary of Rosenbauer America, LLC was held on May 18, 2022, whereby a resolution was passed authorizing; Rob Kreikemeier – C.E.O. or Randy Brummel – General Manager / Vice President, to sign on behalf of Rosenbauer Minnesota, LLC, by his signature, enter into any and all contractual obligations of this corporation.

Rob Kreikemeier  
C.E.O.

6-3-22

Date

State of Minnesota  
County of Chisago

Signed or attested before me on 6-3-22

(Date)

by Robert Kreikemeier

(Name(s) of individual(s))



Signature of Notarial Officer

Title (and Rank): Michelle S. Goldeman, Notary Public  
My Commission Expires: January 31, 2027

## Contact

Rosenbauer Minnesota, LLC.  
5240 257<sup>th</sup> Street  
Wyoming, MN 55092  
Tel.: 651 462 1000

**IRAN LINKED BUSINESS CLAUSE**

The Respondent who is selected as Consultant shall certify to the County that neither it nor any of its successors, parent companies, subsidiaries, or companies under common ownership or control of the Consultant, are an "Iran Linked Business" engaged in investment activities of \$20,000,000.00 or more with the energy sector of Iran, within the meaning of Michigan Public Act 517 of 2012. It is expressly understood and agreed that the Consultant shall not become an "Iran linked business" during the term of this Agreement.

**NOTE: IF A PERSON OR ENTITY FALSELY CERTIFIES THAT IT IS NOT AN IRAN LINKED BUSINESS AS DEFINED BY PUBLIC ACT 517 OF 2012, IT WILL BE RESPONSIBLE FOR CIVIL PENALTIES OF NOT MORE THAN \$250,000.00 OR TWO TIMES THE AMOUNT OF THE CONTRACT FOR WHICH THE FALSE CERTIFICATION WAS MADE, WHICHEVER IS GREATER, PLUS COSTS OF INVESTIGATION AND REASONABLE ATTORNEY FEES INCURRED, AS MORE FULLY SET FORTH IN SECTION 5 OF ACT NO. 517, PUBLIC ACTS OF 2012.**

**CERTIFICATION**

I hereby state that I have read, understand, and become thoroughly familiar with and understand the terms and scope of work contained in the RFP.

I hereby state that all of the information I have provided is true, accurate and complete. I hereby state that I have authority to submit this RFP which will become the basis for a binding contract if accepted by the Emmet County.

I hereby state that this quote will remain valid for six (6) months from this certification date.

Signature: \_\_\_\_\_

Print Name: Randy Brummel

Title: GM/VP Date: 6/3/2022

Company Name: Rosenbauer Minnesota, LLC

Address: 5240 257th Street

Wyoming, MN 55092

Contact Name: Tague Johnson

Office: 651-462-1000 Cell: 651-319-7717

The SPONSOR may obtain equipment life cycle costs if bids received provide significant disparity between bidders. Any costs expected to be incurred for the item over its useful life (that is acquisition, operation and maintenance) are considered. Cost data must be verifiable independently of a claim by the manufacturer.

f. That he also agrees that if he is the successful bidder, he will furnish, prior to the award of the Contract, such other pertinent information regarding his own employment policies and practices as well as those of his proposed sub-contractors and other information as may be required by the SPONSOR and/or Federal and State Agencies.

g. That in the letting of sub-contracts, he will include all necessary clauses as required by the General Provisions of the Contract Specifications. That he agrees to submit with this proposal detailed specifications and descriptive literature for the procurement bid for review by the SPONSOR.

h. That he agrees that no payment shall be made until the fully assembled and operational vehicle, including all equipment and accessories, has been delivered and instruction on use and personnel training has been performed on-site by a trained technician, should he be the successful bidder. He also agrees that personnel training and instruction on use shall be performed at the **Pellston Regional Airport**.

i. That he will provide, if the successful bidder, all the necessary written guarantees and certifications as required by the Contract Specifications at or prior to time of delivery.

j. The bidder also understands that the Aviation Safety and Capacity Expansion Act of 1990 is applicable to this procurement and provides that preference be given to steel and manufactured products produced in the United States when funds are expended pursuant to a grant issued under the Airport Improvement Program. By submittal of this proposal the bidder understands that the following terms apply:

- Steel and Manufactured Products: As used in this clause, steel and manufactured products include (1) steel produced in the United States or (2) a manufactured product produced in the United States, if the cost of its components mined, produced or manufactured in the United States exceeds 60 percent of the cost of all its components and final assembly has taken place in the United States. Components of foreign origin of the same class or kind as the products that are not produced in the US in sufficient and reasonably available quantities and of satisfactory quality shall be treated as domestic.
- Components: As used in this clause, components means those articles, materials and supplies incorporated directly into steel and manufactured products.

c. Cost of Components: This means the costs for production of the components, exclusive of final assembly labor costs.

l. The successful bidder will be required to assure that only domestic steel and manufactured products will be used by the contractor, sub-contractors, material men and suppliers in the performance of this contract, except those:

1. That the US Department of Transportation has determined, under the Aviation Safety and Capacity Expansion Act of 1990, are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality;

2. That the US Department of Transportation has determined, under the Aviation Safety and Capacity Expansion Act of 1990, that domestic preference would be inconsistent with the public interest; or

3. That inclusion of domestic material will increase that cost of the overall project contract by more than 25 percent.

NAME AND ADDRESS OF BIDDER:

BY: R. Brummel NAME: Randy Brummel

DATE: 6/3/2022 TITLE: GM/VP

BIDDER agrees to provide the specified procurement at the following Lump Sum prices quoted. (US Currency)

BASE BID (Aircraft Rescue And Fire Fighting Vehicle (ARFF) \$ 721,063.00

Total amount of Base Bid (written in words): Seven Hundred Twenty One Thousand Sixty-Three Dollars

BA-2.1 \*\*(Radio Circuit and Equipment )

\$ 22,731.00

Twenty Two Thousand Seven Hundred Thirty One Dollars

**The successful bidder shall be determined by the BASE BID amount provided.**

The above Lump Sum prices are firm for the specified items. The following exceptions to the advertised specifications are applicable: (BIDDER must tabulate all proposed exceptions of the applicable specifications. Attach supplemental sheets as necessary).

Exceptions to the Advertised Specifications are applicable and are reflected in the total amount of bid:

#### **H. CONFLICT OF INTEREST**

Disclose any conflicts or perceived conflicts of interest.

Identify what procedures your firm utilizes to identify and resolve conflicts of interest.

#### **I. INSTRUCTIONS FOR FIRMS:**

For your bid to qualify, you must submit three (3) hard copies in your SEALED BID AND EMAIL one (1) PDF electronic copy to Priscilla Meyer at [pmeyer@emmetcounty.org](mailto:pmeyer@emmetcounty.org)

**no later than 3:00 p.m. on June 7, 2022 to:**

EMMET COUNTY FINANCE DEPARTMENT  
ATTN: Priscilla Meyer, Civil Counsel Office  
200 DIVISION STREET, SUITE G70  
PETOSKEY, MI 49770

1. Response to this RFP MUST be clearly marked RFP# EC-04-2022#09 – AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) VEHICLE.
2. Questions shall be submitted in writing to Ryan Bachelor at [rbachelor@emmetcounty.org](mailto:rbachelor@emmetcounty.org) no later than 3:00 p.m. on May 4, 2022:
3. This RFP, any addendums, and any potential questions and answers will be posted on the Emmet County website at <https://www.emmetcounty.org/open-bids-rfps/>.
4. The County reserves the right, in its sole discretion, to reject any and all proposals, or parts of any proposal, for any reason whatsoever and waive technicalities.
5. The County will only accept proposals that are responsive to the RFP and are prepared and submitted in compliance with the requirements set forth in this RFP.
6. Emmet County will not award any proposal to an individual or business having any outstanding amounts due from a prior Contract or business relationship with the County or who owes any amount(s) for delinquent Federal, State or Local taxes, fees and licenses.

**No late submissions will be accepted.**

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The Respondent who is selected as Consultant shall certify to the County that neither it nor any of its successors, parent companies, subsidiaries, or companies under common ownership or control of the Consultant, are an "Iran Linked Business" engaged in investment activities of \$20,000,000.00 or more with the energy sector of Iran, within the meaning of Michigan Public Act 517 of 2012. It is expressly understood and agreed that the Consultant shall not become an "Iran linked business" during the term of this Agreement.

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I hereby state that all of the information I have provided is true, accurate and complete. I hereby state that I have authority to submit this RFP which will become the basis for a binding contract if accepted by the Emmet County.

I hereby state that this quote will remain valid for six (6) months from this certification date.

Signature: R. Brummel

Print Name: Randy Brummel

Title: GM/VP Date: 6/3/2022

Company Name: Rosenbauer Minnesota, LLC

Address: 5240 257th Street

Wyoming, MN 55092

Contact Name: Tague Johnson

Office: 651-462-1000 Cell: 651-319-7717



SPECIFICATION PREPARED FOR

# Pellston Regional Airport

**NEW PANTHER 4x4 1598 GALLON (6050 LITER)**

**ROSENBAUER  
AIRPORT - RESCUE and FIRE FIGHTING  
RAPID INTERVENTION VEHICLE  
"CLASS 4" 4x4**



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## DEFINITIONS

The intent of these specifications is to describe the requirements necessary to supply a well-designed, self-contained, properly engineered diesel-powered Aircraft Rescue and Fire Fighting (ARFF) vehicle. The unit shall be new and unused.

The ARFF vehicle shall consist of a crew cab on a 4x4, custom chassis with single tires. It is to be all-wheel drive, single engine-diesel powered, with an automatic transmission.

The fire-fighting package shall include a water tank with a minimum capacity of 1598 gallons (6050 liters) and a liquid foam agent concentrate tank with a working capacity sufficient for two tank loads of water at the maximum tolerance specified in NFPA 414.

The unit shall contain all component parts necessary for a water/foam proportioning system capable of expelling agent through a cab-controlled roof turret, a bumper turret, gated discharge(s), twin agent hand line and pre-connected handline(s) as detailed hereafter in these specifications.

The vehicle shall also be equipped with an auxiliary agent system. The system shall be operable from the cab and exterior of the vehicle.

Discharges shall meet all current applicable discharge rate requirements of FAA Advisory Circular #150-5220-10E and NFPA 414 standards in effect at time of bid.

This apparatus shall be equipped with various other components as called for in these specifications.

During the construction of the vehicle, Rosenbauer reserves the right to make running production changes if the changes enhance the safety, operation and maintenance of the vehicle.

## USB STORAGE

For ease of service the chassis shall come with an on-board USB flash drive. The flash drive shall have a minimum of 8 GB of storage capacity; and shall be located in the dash panel.

The following items shall be stored on the Flash Drive.

- As built wiring diagrams
- Chassis, body and HRET manuals when applicable.

The USB shall be accessible through a USB-A to USB-B cable.



## **TECHNICAL INFORMATION**

In addition to the on-board USB storage, Rosenbauer will furnish two (2) Thumb drives and one (1) hard copy technical information with the following publications in accordance with standard commercial practices applicable to the vehicle (including body and special fire suppression equipment) furnished with the vehicle. Each set shall be composed of one (1) copy each of:

- Operator's manual with lubrication charts.
- Parts manual
- Electrical schematics
- Maintenance and Service manual.

These manuals will cover the complete vehicle.

## **FAMILIARIZATION GUIDE**

Rosenbauer shall provide a customized printed hard copy familiarization guide for each fire personnel specific to the purchaser's vehicle which will include the following:

- Safety Information
- Vehicle Information
- Familiarization Vehicle External Components
- Driver Cab Controls – Overview
- Transmission
- Center Console Controls
- Pump system
- Auxiliary agent System
- Electrical System
- Preparations for use
- Starting Procedures
- Pre-Start Checks, Jacking, Trailering, & Roll Up Door Maintenance

## **WATER FOAM AGENT APPLICATORS**

Per the FAA circular and NFPA 414

Each water/foam agent handline shall be capable of delivering a finished foam solution that meets the applicable rate, range, and pattern standards of Table 4, Performance Parameters 3 or 4.

Each water/foam agent handline shall deliver finished foam of a quality that meets the applicable standards of Table 4.



Each water/foam agent turret shall be capable of delivering a finished foam solution that meets the applicable rate, range, and pattern standards of Table 4, Performance Parameters 5 or 6, as applicable.

Each water/foam agent turret shall deliver a finished foam of a quality that meets the applicable standards of Table 4.

All water/foam applicator performance requirements are based on the assumption that foam used to perform the tests is an approved foam concentrate; e.g., will pass the military AFFF foam specification 50 ft<sup>2</sup> fire test and the burn back resistance test.

## **QUALITY ASSURANCE**

Rosenbauer will fully comply with all items regarding quality assurance, test and technical service and training as defined in NFPA 414.

## **DELIVERY**

The completed vehicle shall be delivered by flatbed truck to a location designated by the customer. Upon delivery Rosenbauer shall supply a qualified technician to inspect the vehicle, perform any final adjustments to the vehicle and make the vehicle ready for service.

## **VEHICLE FAMILIARIZATION**

Rosenbauer shall provide a qualified technician after delivery and acceptance by the purchaser acquaint fire department personnel in the proper use and application of the ARFF unit as necessary to accommodate staffing

Familiarization for fire fighters shall consist of the following:

- Classroom instruction on proper operation and maintenance of this ARFF vehicle to include visual inspection of vehicle, indicating various controls and instruction in proper operation of the unit.
- Actual operation/driving of the ARFF vehicle to include instructions in proper driving of the vehicle, foam and water discharge, pump operation, and familiarity with all necessary firefighting functions.
- Familiarization will include the use of computer aided programs, manuals and hands-on familiarization.
- Rosenbauer will provide familiarization for department maintenance personnel on the vehicles major systems and lubrication points.



## **BASE VEHICLE WARRANTY**

Rosenbauer shall provide a one (1) year bumper to bumper warranty on the vehicle.

A warranty statement shall be provided that will include the following as a minimum:

- Manufacturer's obligations
- Duration of warranty period for vehicle, engine, transmission, and water/foam tanks
- Warranty procedure
- Disclaimers

Rosenbauer shall support the vehicle with factory trained technicians to perform warranty repairs during the warranty period.

## **ENGINE WARRANTY**

The engine shall be covered by a two (2) year warranty. Warranty details shall be provided with the bid submission.

The warranty service center for Volvo Penta is Walstrom Marine, located in nearby Harbor Springs and Cheboygan.

## **TRANSMISSION WARRANTY**

The transmission shall be covered by a two (2) year warranty. Warranty details shall be provided with the bid submission.

## **WATER PUMP WARRANTY**

The water pump shall be covered by a five (5) year warranty. Warranty details shall be provided with the bid submission.

## **WATER TANK WARRANTY**

The water tank shall be covered by a lifetime warranty. Warranty details shall be provided with the bid submission.



## **PAINT WARRANTY**

A five (5) year paint warranty shall be provided for all portions of the apparatus that have been painted. Warranty details shall be provided with the bid submission.

## **PRE-CONSTRUCTION MEETING**

In order to ensure compliance with the contract specifications, Rosenbauer shall provide a factory representative to conduct a virtual pre-construction conference within 30 days after receipt of order.

## **VEHICLE TESTING**

The vehicle shall be tested in accordance with NFPA 414 and FAA 5220-10E. A final report of the vehicle testing, and certification shall be provided to the end user for their records.

Unit shall comply with all requirements of FAA Advisory Circular #150-5220-10E and NFPA 414 standards in effect at time of bid.

## **PAINTING**

The vehicle will be painted/striped in accordance with the FAA AC and shall include the following:

A coating of epoxy sealer shall be applied with a minimum of 1.0 mil dry film build. The epoxy sealer allows for maximum adhesion to the body material. A color coating of Urethane Paint Direct Gloss with Catalyst shall be applied with a minimum of 2.0 mil dry film build. The catalyst provides a base level UV barrier to prevent fading and chalking.



## **PAINTING**

The vehicle will be painted/striped in accordance with the FAA AC and shall include the following:

Cab: per the FAA specification (lime yellow)

Frame: black

Superstructure: FAA specification (lime yellow)

Front angle of approach: Combination black and FAA (lime yellow)

A coating of epoxy sealer shall be applied with a minimum of 1.0 mil dry film build. The epoxy sealer allows for maximum adhesion to the body material. A color coating of Urethane Paint Direct Gloss with Catalyst shall be applied with a minimum of 2.0 mil dry film build. The catalyst provides a base level UV barrier to prevent fading and chalking.

## **UNDERCOATING**

The wheel well areas of the cab and body shall be sprayed with an automotive undercoating.

## **WHEEL PAINT**

The chassis wheels shall be painted black in color.

## **LETTERING**

Single color reflective lettering and numerals shall be applied per customer direction and sized appropriately to the vehicle design as space allows. Lettering details shall be discussed and designed during pre-construction but will include:

PELLSTON REGIONAL AIRPORT

AIRCRAFT RESCUE FIREFIGHTING

Airport logo

#4405 on both sides and top of vehicle

The customer shall provide to the manufacturer the approved airport/ARFF department emblem for installation by the manufacturer's graphic specialists. The manufacturer shall advise the customer when the graphics should be delivered to them for installation so there is no delay in prepping the apparatus for final inspection/delivery. A final design rendering will be provided for approval prior to graphics being applied.



## **ROOF NUMBER**

An unpainted aluminum plate shall be provided on the roof of the cab for placement of the vehicle identification number and shall also serve as the mount for radio antenna's if required. The identification number shall be reflective, and color shall be determined by the Customer.

====No Painted Rear Number Plate====

## **STRIPING**

An 8" reflective stripe shall be applied to the perimeter of the vehicle to meet the requirements as outlined in the FAA Advisory Circular #150-5220-10E. Striping information shall be discussed and designed during pre-construction.

## **WINTERIZATION SYSTEM**

A winterization system that meets the requirements of FAA Advisory Circular #150-5220-10E shall be furnished and installed on the vehicle. Appropriate controls for the operation of the winterization system shall be supplied in the cab and accessible from the driver's position. The heating system shall be plumbed to the chassis fuel system with an individual designated fuel line for the heating system. The system shall also be connected to the chassis electrical system and be operable with the truck engine running. The winterization system shall consist of the following components:

### **DIESEL FIRED HEATER**

A 13,650 Btu/h diesel fired heater shall be provided. The heater shall have a nozzle burner system to provide instant heat and low maintenance. The heater shall be heavy-duty modular design and have electronic ignition to ensure reliable start and low power consumption.

One (1) heater shall be mounted in the following locations.

### **PUMP COMPARTMENT**

The pump compartment and plumbing shall be provided with an auxilliary diesel fired heater.



## PERFORMANCE

The design objective for the vehicle and the fire extinguishing system shall be performance in accordance with FAA Advisory Circular.

Rosenbauer shall provide a data plate.

This data plate shall be installed in the cab of the vehicle and visible to the operator.

Acceleration from 0-50 mph  
(0-80 kph): Less than 25 seconds

Top speed: Approximately 70 mph (112 kph)

Braking from 60-0 mph  
(96-0 kph): Less than 235 feet (71.5 meters)

Side Slope Stability: 30° (58% grade)

Pump & Roll Discharge  
On Slope: 21.8° (40%)

Steering Max Cramp Stability: 12° (20%)

Dynamic Balance: 22 mph (min)

Pump performance: Up to 2100 GPM (8000 LPM)

## ENVIRONMENTAL

The vehicle shall be capable of withstanding the following conditions without detrimental effect to subsequent operation of the vehicle or any of the fire extinguishing systems:

- a) Dust particles, as encountered in desert areas.
- b) The corrosive effects of salt fog.
- c) Material decay from fungus and mildew.
- d) Relative humidity up to 100 percent, as well as wind driven snow, sleet, rain, and vehicle self-splashing of water.

## GRADABILITY

The vehicle shall be able to ascend a 50-percent grade in its fully loaded condition.



## **OPERATIONAL RANGE**

The fully loaded vehicle shall be able to:

Operate continuously for 30 miles (48 km) at speeds up to 55 mph (88 kph). The test route shall include agricultural lands, paved and unpaved roads, and grades typical of those encountered at the airport.

Negotiate pooled water to a depth of 2 inches (50 mm) for a distance of at least 150 feet (45 meters) at a speed of at least 40 mph (65 kph) without engine flooding/stalling, loss of directional control, loss of braking, or electrical system(s) shorting.

Operate for 10 minutes on dry, paved roadway at not more than 2 mph (3.2 kph) at an engine speed that does not result in rough, irregular operation.

Ascend a dry, paved incline having an 8- percent grade for a distance of 0.25 mile (0.4 km) at a speed of not less than 20 mph (32 kph).

Negotiate (J Turn) a 90°, 150-foot (45 meter) radius turn at 30 mph (48 kph) on smooth, dry, level pavement without loss of directional control or stability.

## **TOP SPEED**

The vehicle shall be able to consistently reach a top speed of 70 mph (112 kph) and maintain a constant speed of at least 60 mph (96 kph) on typical paved, level (grades of less than 1 percent) highway surfaces for a minimum distance of 20 miles (32 km) without showing overheat symptoms in any portion of the cooling system or power train.

## **FLEXIBILITY**

The design objective for the vehicle frame, suspension, and mounting of major components shall be to provide the capability for diagonally opposite wheel motion up to 14 inches (355 mm) above the ground without raising the remaining wheels from the ground or causing interference or parts failure. The vehicle is designed in such a way as to exceed this requirement. The upper motion of the vehicle suspension is such that it will travel a minimum of 7 inches (177 millimeters) in an upward fashion and exceed the lower travel limit of seven inches in such a way to maintain tractability and prevent “hanging” of the suspension when conditions exceed this parameter.



## MAINTAINABILITY

The vehicle design shall be such that it:

Uses the fewest number of different parts consistent with the specified performance.

Permits maintenance with commercially available, general purpose mechanic tools and equipment. Rosenbauer shall provide and document in the maintenance manual introduction any special or nonstandard tools required, and any unique test equipment required to perform operator/owner maintenance and service.

Limits the number of tools and the variety of spare parts required for maintenance by such design practices as reducing the variety of bolt sizes, light bulb sizes, wire gauges, tubing, and pipe sizes as consistent with safety and performance requirements.

The vehicle shall utilize disconnect plugs, receptacles, junction boxes, bus bars, multiple-line connectors in the electrical systems, and readily detachable fittings in hydraulic and pneumatic systems, as applicable. All disconnect points shall be clearly labeled. All hydraulic and pneumatic lines and electrical wires shall be color, function, or number coded.

As applicable pilots, guides, slides, carriages, or other features shall be utilized if it adds to the ease of removal and installation or attachment of components.

The vehicle shall use a fastener system that is easily disassembled and reassembled for all cabinets and bodywork that must be removed for access for maintenance and removal of components for repair or replacement. Uses fasteners not limited to brackets, nuts, bolts, washers, screws, and rivets of stainless steel or other materials resistant to corrosion.

Locates drains, filler plugs, grease fittings, hydraulic line-bleeders, and checkpoints so that they are readily accessible and do not require special tools for proper servicing.

The vehicle shall be designed and constructed so that the installation of each major subsystem or critical part can only be in its proper operating position.

Provides accessible connections, where needed, to attach troubleshooting, analytical, and diagnostic equipment to appropriate vehicle subsystems.

Operates with standard commercial lubricants. Grease and oil seals shall be of a design and located to provide accessibility for inspection, servicing, and replacement. Access to lubrication points shall be provided by means of an easy opening door or hinged panel. Lubrication fittings shall be located in accessible, protected positions. Parts or assemblies that are not readily accessible for direct lubrication or are likely to be overlooked because of inaccessibility shall have extended fittings. A safety chain shall attach filler caps to lubrication fill points where practical.



## **LUBRICATION**

The engine and transmission shall operate efficiently and without detrimental effect to any drive train components when lubricated with standard, commercially available lubricants in accordance with the recommendations of the engine and transmission manufacturers.

The engine oil and transmission fluid filters shall be of the full-flow type with a replaceable spin-on element.

All moving parts requiring lubrication shall have a means of providing for such lubrication. There shall be no pressure lubrication fittings where their normal use would damage grease seals or other parts.

The vehicle shall be serviced prior to delivery with lubricants, brake and hydraulic fluids, and a cooling system fluid suitable for use in the temperature range expected at the airport.

## **COMPONENT PROTECTION**

All oil, hydraulic, air, water, foam concentrate, and electrical system conduits, tubing, and hoses shall be located in protected positions. They shall be secured to the frame or body structure and, except where a through-frame connector is necessary, shall be fitted with protective looms or grommets at each point where these items pass through panels or structural members.

All radiator grills, louvers, lamps, tie rods, drive shafts, piping, and other vulnerable components shall be protected by component location or by guards adequate to prevent damage from brush, stones, logs, or any other debris likely to be encountered by the vehicle during off road performance.



## BALANCE AND CLEARANCES

The weight shall be distributed as equally as practical over the axles and tires of the fully laden vehicle. The difference in tire load between tires on any axle shall not exceed 5 percent of the average tire load for that axle. The difference in load between axles shall not exceed 10 percent of the load on the heaviest axle. The front axle shall not be the most heavily loaded axle.

The fully loaded vehicle shall be able to meet the side slope stability performance requirements specified in FAA Advisory Circular.

Approach angle:	30°
Departure angle:	30°
Inter axle clearance angle:	12°
Side slope stability:	30°
Under body clearance:	25" (635 mm)
Under axle clearance:	Axles: 14.75" (374 mm)

## DIMENSIONS

The overall height, length, and width of the vehicle shall be the smallest dimensions consistent with the rated payload for its class and the operational performance requirements of the vehicle.

Overall length:	approx. 33' 7" (10,236 mm)
Overall width:	approx. 11' (3,352 mm) including mirrors
Overall height:	approx. 12' 1" (3,683 mm) to top of guard rails
Wheel base:	15' 8" (4,800 mm)

## LOAD RATING

The functional load rating of the frame shall equal or exceed the actual gross vehicle weight (GVW). The GVW includes complete chassis; cab with attachments, accessories, and equipment; the body with rated agent payload, including a full complement of crew, fuel, lubricant, coolant, firefighter protective clothing, equipment, and breathing apparatus in appropriate numbers; and firefighting hand tools and appliances.

Weight ratings:	
Front axle:	28,500 lbs. / 12,927 kg
1st Rear axle:	28,500 lbs. / 12,927 kg
Total:	57,000 lbs. / 25,854 kg



## **EMISSIONS RATING**

The engine shall be Tier IV final emission ratio certified.

## **ENGINE**

A high-performance diesel engine with electronically controlled fuel injection system and modern, fuel efficient 4-cyle design as follows:

Make/Model: VOLVO D16

High performance diesel engine with electronically controlled fuel injection system

No. of cylinders: 6, in line

Aspiration: turbocharger, charge air cooling, 4-cycle

Engine output: 700 HP (515 kW) at 1,800 rpm

Maximum torque: 2,323 ft. lbs. (3,150 Nm) at 1,200 rpm

Displacement: 16.1 liters

## **ENGINE BRAKE**

A Volvo engine brake shall be provided for assisted braking. The engine braking system shall be activated by releasing the throttle pedal.

The brake system can be deactivated by pressing an ON/OFF switch located on the dashboard.

## **COOLING SYSTEM**

Type: Water-ethylene/glycol cooling

Performance: System shall have the capability to stabilize the vehicles engine temperature within the limits specified by the engine manufacturer under all operational conditions encountered by the vehicle.



Construction:	Heavy duty type, bolted construction modular design that includes the transmission oil cooler, remote mounted, semitransparent reservoir tank for easy fill access, reservoir is visible from an access door at rear side of vehicle. Drain cocks shall be provided on the low points of the system to aid in draining the system completely if needed.
Air flow:	Thermostatically clutch controlled pusher fan shall provide fresh air to the radiator by means of an air duct. Air is ingested through the top of the vehicle and exhausted out the rear. Hot air from the engine compartment is never directed across the radiator cooling fins and provides excellent engine temperature control.
Hoses and Connectors:	All hoses associated with the coolant system (radiator and heater) shall be made of a silicone material and shall be secured with constant torque clamps.

## **COOLING SYSTEM**

The cooling system shall be rated for -40 to 110F (-40 to 43C)

## **FUEL SYSTEM**

Primary Fuel Filter/

Water separator: One (1) thermostatically controlled heated fuel/water separator

Secondary Fuel Filter: One (1) filter element

## **FUEL RE-PRIME**

A Fuel re-prime switch and electric in-line aux fuel pump shall be supplied to prevent loss of prime to the engine and aid in the replacement of fuel filters during routine maintenance.



## **FUEL TANK**

Capacity:	One (1) nominal 80-gallon fuel tank shall be supplied. The fuel tank supplied meets the performance requirements as outlined in NFPA 414 which states that the vehicle fuel tank shall have sufficient capacity to provide for a minimum of 30 miles of highway travel at 55 mph average plus 2 hours of pumping at the full-rated discharge. Additional fuel capacity shall be provided for a minimum of four (4) hours of operation of each accessory item (such as a generator or fuel-fired heater(s) that uses the common fuel tank as a source.
Location:	Mid-ship on right side.

## **EXHAUST SYSTEM**

The vehicle will be supplied with a stainless-steel pipe and muffler. The muffler shall be mounted on top of engine compartment. The exhaust is terminated in such a way as to minimize noise on the interior and exterior of the vehicle.

## **EXHAUST TERMINATION**

The exhaust shall terminate vertically that directs all exhaust away from the vehicle.

## **TRANSMISSION**

A single source transmission system, consisting of power divider, torque converter, and six-speed automatic power shift transmission with integrated transfer case shall be provided to ensure perfect matching of these components. A single supplier allows easy service support for these major drive train components.

The main transmission is remotely mounted in the center of the chassis, low in the frame rails. The low mounting position while still providing excellent ground clearance allows for a lower center of gravity, thus increasing the dynamic stability of the vehicle.

The input section of the transmission consists of two gear-driven clutch shafts. Each shaft contains two (2) 7" (177 mm) clutch packs of the orifice type. When the clutch is engaged, output is from gear and drive rings on the clutch shafts and through gears on the compound shaft. This shaft contains two 9" (228 mm) clutch packs equipped with individual feedback dump valves. The front 9" (228 mm) clutch is an LD type clutch and the rear is an S type clutch. A spline-connected output gear on the 9" (228 mm) clutch shaft is meshed with the input gear on the inter-axle differential.



The differential includes two independent output shafts connected through the inter-axle differential. The differential has a clutch that when applied, locks up the differential providing a solid drive through the differential to the outputs.

Manufacturer: Twin Disc 6-speed fully automatic powershift transmission.

## **SUSPENSION**

The axles and suspension system shall be such that the total un-sprung weight of the vehicle will not be greater than 20 percent of the in-service GVW.

Double-acting hydraulic shock absorbers shall be provided for all axles or bogies, as applicable.

Energy absorbing stops shall be installed so as to prevent damage to axles, drive shafts, the engine oil pan, or any other portions of the chassis from bottoming.

The vehicle utilizes a high-performance coil spring system (HPCSS). A variable rate coil spring in combination with a 4 link V-rod / trailing rod system w/ anti-roll bar over live rigid axle provides superior off/on road capabilities that comply with all current regulations including FAA, NFPA and ICAO. The system incorporates a high-performance variable rate coil spring and dual acting shock absorber mounted on each wheel. The live rigid axle provides strength and is tied to a torsion bar and V-link rod allowing the rigid axle to move in an independent manner. Each wheel will be supplied with an energy absorbing bump stops to prevent the suspension from contacting the chassis. The system allows for a minimum of 16 inches of wheel travel with lower wheel travel exceeding all applicable standards to prevent the wheel from “carrying” in asymmetrical travel conditions. Wheel travel and tractability exceed all applicable standards. The HPCSS system shall provide ride capabilities that reduce road shock, protect the body and mounted components from damage and provide the operator positive feedback to during extreme vehicle maneuvering.

The progressive coil spring over live rigid axle system has by design a lower roll moment than a half shaft driven independent suspension system and provides positive control in on road / high speed cornering situations and provides a safe controllable ride in off road conditions. The suspension system combines the best features of independent coil spring suspensions and rigid axle systems, allows for independent movement of the wheels, and has a minimum of moving parts, extreme strength and weight carrying capacity.



The suspension system is fully tested and is NFPA/FAA/ICAO compliant and meets all current requirements for an Off-Road High Mobility Suspension System.

#### Front Suspension

Manufacturer: Rosenbauer Motors

Type: High Mobility On/Off Road Coil Spring Live Rigid Axle Suspension

Design: Variable rate coil spring suspension with heavy duty double acting shock absorbers, v-link rods, torsion bars and anti-roll stabilizer bar.

#### Rear Suspension

Manufacturer: Rosenbauer Motors

Type: High Mobility On/Off Road Coil Spring Live Rigid Axle Suspension

Design: Variable rate coil spring suspension with heavy duty double acting shock absorbers, live rigid axle, v-link rods, torsion bars and anti-roll stabilizer bar.

## **WHEELS AND TIRE ASSEMBLY**

Single tires for optimal off-road performance are provided on all axles. The tires have high mobility non-directional tread. All tires are interchangeable without restrictions.

#### Front Wheels

Wheel type: Bolted steel wheel

Wheel size: 18.00 x 21

Tire type: High mobility tires

Tire size: 24R x 21

Wheels and tires are interchangeable with rear axle.

#### Rear Wheels

Wheel type: Bolted steel wheel

Wheel size: 18.00 x 21

Tire type: High mobility tires

Tire size: 24R x 21

Wheels and tires are interchangeable with front axle

## **TIRES**

The tires provided shall be Michelin brand for optimal off-road performance on all axles.



## **SPARE WHEEL and TIRE ASSEMBLY**

One (1) spare wheel and tire assembly interchangeable with front or rear axle shall be provided.

## **MUD FLAPS**

Mud Flaps shall be installed behind each wheel well to reduce damage from stones, brush etc. being thrown off the tires.

## **TIRE PRESSURE MONITORING SYSTEM**

A tire pressure monitoring system shall be provided which monitors the pressure of each individual wheel with a digital read out located in the cab.

## **TOW EYES & SHACKLES**

Two tow eyes shall be provided at the front and at the rear of the frame with a shackle for each tow eye.

## **BRAKE SYSTEM**

A pneumatically actuated brake system shall be provided that has been tested and certified. The system shall include an all-wheel, split-circuit, power-assisted service brake, a modulation capable emergency brake and parking brake.

The braking system meets or exceeds FAA, NFPA, ICAO and the Federal Motor Vehicle Standard (FMVSS) 121 requirements. An ABS braking system is provided as standard for improved safety. Brake drums are directly mounted to hub and wheel. In case of a major drive shaft failure, the vehicle can still be stopped safely.

## **SERVICE BRAKES**

Type:

Dual circuit brake system w/ABS meeting FMVSS 121, NFPA 414 and FAA Advisory Circular #150-5220-10E. ABS system shall include a self-diagnostic system and warning indicator on the cab dash instrument cluster to advise the driver of operation or malfunction.



Actuation:	Floor mounted treadle foot valve for service brake. Dash mounted push-pull valve for parking brake.
Compressor:	Capacity 37 cfm direct drive engine mounted
Miscellaneous:	Push-lock color coded nylon tube throughout routed along chassis frame rail; air tanks equipped with heated automatic drain valves; air compressor discharge line stainless / Teflon; reservoir capacity approx. 4,950 in <sup>3</sup> (80 l); air dryer w/heated element (Bendix ADIP).
Rapid Buildup:	A fast buildup system is provided to permit release of spring brakes within 15 seconds of engine start up based on empty air tanks.
External Air Tank drains:	Provisions for draining the air tanks from a centralized remote point on the vehicle shall be provided eliminating the need for a person to go under the vehicle. The drain points shall be labeled.
Performance:	Exceeds FAA, NFPA, ICAO and FMVSS requirements  20 - 0 mph (32-0 kph) in less than 35 ft (10.6 m) Requirement is 35 ft (10.6 m)  40 - 0 mph (64-0 kph) in less than 131 ft (40 m) Requirement is 131 ft (40 m)
Holding Capacity:	Min. 60% slope
Notes:	The pneumatically operated firefighting functions are supplied from a separate dedicated, pressure protected accessory reservoir.



## **FRONT AND REAR BRAKES**

Front Brakes

Type: Wedge-Type Drum Brakes

Rear Brakes

Type: Wedge-Type Drum Brakes

## **AXLES**

The axles shall be rated and certified as being suited for the intended use. The axle manufacturer's approved rating shall not be raised to conform to the requirements of this specification.

Front and rear axles shall have adequate capacity to carry the fully loaded vehicle under all intended operating conditions. The maximum variation in axle tread shall not exceed 20 percent of the tire(s) sectional width at rated load.

Tractive power at each wheel shall be achieved by use of torque proportioning differentials or other suitable automatic devices that will ensure that each wheel of the vehicle is driven independently of the other wheels.

Front axles shall be equipped with steering drive ends designed to eliminate fluctuations in angular velocity of the wheels when cramped either left or right at all normal operating speeds.

An all-wheel drive axle system is provided. The well proven design is widely used in commercial and military applications. An extensive testing cycle applied to pre series vehicles ensures reliability and longevity in this specific ARFF application.

The usage of torque increasing planetary hub ends reduces the size of the differential housings and improves the ground clearance for extensive off-road operation.

Front Axle

Make: Kessler

Type: The front axle is of the front driving/steer type with suitable reduction gearing via planetary gears at the hubs. A driver operated differential lock is provided.

Front Brakes

Type: duplex wedge type drum brakes



#### Rear Axle:

Make: Kessler

Type: Double reduction with suitable reduction gearing via planetary gears at the hubs. Driver operated differential locks and an inter-axle lock on the first rear axle are provided.

#### Rear Brakes

Type: simplex wedge type drum brakes

## **PARKING BRAKE**

Type: Spring apply, pneumatically activated release

Location: At rear axles, two (2) chambers per axle. Parking brake warning light indicator on cab dashboard.

Holding Capacity: Min. 30 % slope

## **STEERING**

The power assisted steering shall have sufficient capacity so no more than 15 pounds (6.8 kg) pull is necessary on the steering wheel rim to turn the vehicle wheels from lock to lock of the fully loaded vehicle when stationary.

The design of the steering mechanism shall permit manual steering to bring the fully loaded vehicle to a safe stop after power-assist failure.

The vehicle shall perform as follows when driven on a steering pad around a 100-foot (30 m) radius circle:

- (1) With increasing speed, the steering angle shall increase; over steer shall not be acceptable.
- (2) The vehicle shall remain on the prescribed path until achieving a speed at least equal to the standard specified in Table 2, Performance Parameter

The wall-to-wall turning diameter shall be no greater than three times the length of the vehicle.

A tilt/telescoping steering wheel/column shall be provided.

Ram assisted power steering system is provided.

Steering Column: Tilt-telescoping

Steering Wheel: 18" (457 mm) Four Spoke w/ integrated horn button.



## **STEERING POSITION**

The steering column and wheel shall be mounted left center of the cab.

## **COACH WORK**

The Rosenbauer Panorama Safety Cab certified per the latest regulations including NFPA 414, FAA Advisory circular 150-5229-10E as well as ICAO and using ECE R29-3 and was tested with a real crash test to ensure cab safety.

Parts shall be fabricated from materials that will provide the lightest weight consistent with the needs for strength, as well as heat and corrosion resistance. Safety of the crew shall be a primary consideration in coach work, especially the protection of occupants during a roll over.

A fully trimmed ROSENBAUER Panther ARFF two door cab providing forward left center driving position shall be provided. The cab is constructed of welded aluminum box sections with formed aluminum sheets. Large windows provide excellent all around and upward visibility through tinted safety glass and tempered side windows. Heavy duty light alloy extrusions provide front impact protection as well as a roll cage to protect the occupants.

A panorama-view windshield, in combination with full glass side walls as well as the compact dashboard, provide an excellent range of vision, including from the rear crew seats. The roof window offers a perfect view to the roof turret.

The windshield is made of laminated safety glass, side and roof windows are made of tempered safety glass.

The cab entrance is built with a low positioned outside step, integrated steps and wide opening doors that allow for safe access and offers more space for equipment in the cab with an additional compartment integrated in the step.

Access to the roof turret through a roof hatch is possible by using the rear wall mounted steps. Gas springs support the opening of the hatch and keep it in safe position even in windy conditions.

## **CAB DOORS**

Large safety doors are provided on both sides. The doors open 90° to provide maximum safety for crew members entering and exiting with SCBA. In addition, a true staircase, not a ladder type entry shall be provided.



## **CAB DOOR ELECTRIC WINDOWS**

The cab door sliding windows shall be electrically actuated. Window controls shall be mounted on the center dash and accessible for operation by both front crew members (driver and turret operator).

## **BUMPER**

A heavy-duty bumper is provided to protect the lower cab section and provide an integrated mounting provision for the bumper turret.

## **ROOF ACCESS / EMERGENCY EXIT PROVISION**

A marine quality roof hatch shall be provided for roof access and as an emergency exit provision should such an exit be required.

## **WINDSHIELD WIPERS**

Three (3) wipers with jet washers are provided including a reservoir. The reservoir fill cap is easily visible and accessible.

## **AUTOMOTIVE WINDOW TINT**

The front windshield and side windows of the cab shall be provided with standard automotive window tint.

## **WINDSHIELD DELUGE SYSTEM**

A Windshield Deluge system shall be furnished and installed on the chassis cab. The windshield deluge system shall have four (4) nozzles mounted above the windshield and have a separate pump assembly with activation switch in the cab. Minimum pump output shall be three (3) gallons per minute (11 liters per minute). The windshield deluge system shall be plumbed to direct clear water onto the windshield. The system shall be provided with a screen to prevent debris from rendering any nozzles or the pump inoperable.



## **INSULATION AND WATERPROOFING**

Insulation shall be fire and water resistant and of a type that will not pack or settle. Provision shall be made to allow the drainage of water from between the walls by gravity flow. The average heat loss shall not exceed 0.24 BTU/ft<sup>2</sup> (0.76 W/m<sup>2</sup>) per degree Fahrenheit per hour. All insulation that could be exposed to abrasion or damage from equipment storage or operator activities shall be provided with a protective covering. All insulation that will be located on the exterior of the vehicle shall be protected from damage or exposure by a permanent cover to be constructed to match the vehicle exterior.

All components shall be designed, installed and/or protected so that their normal function will not be impaired by heavy rains, road splash, formation of condensation, or the spillage of extinguishing agents from nozzles and fittings, recharging operations, or leaks in the piping system.

The vehicle shall incorporate the use of air conditioning and the system shall meet current automotive/truck and environmental protection standards for vehicle air conditioning. The air conditioning system shall not change the acceptable pass/fail criteria for any of the performance tests of the vehicle or the firefighting system.

## **INTERIOR CAB EQUIPMENT**

A low floor and a wide door on each side of the cab to allow rapid entry and exit shall be provided. The ergonomically laid out instrument panel is equipped with a full set of instruments, weatherproof illuminated switches and a complete warning system with indicator lights and audible alarms. All substantial firefighting functions including the turret controls are within reach of driver and co-driver on a center console.

- Heavy duty non-slip flooring shall be provided in the forward portion of the cab.
- Instrument panel, with integral dash mounted controls.
- Heater/defroster; fresh air and re-circulating type, outlets spread evenly across the dash.
- One (1) grab handle at each cab door for entry assistance.
- Windshield shall be one-piece, high visibility and shatter-proof laminated safety glass.
- Roof viewing window.

## **SUN VISORS**

Interior sunshades shall be installed on the upper portion of the cab windshield and roof window.



## **POWER POINT**

One (1) dual USB 12-volt power point shall be provided and incorporated in the dash console.

## **POWER POINT**

One (1) 12-volt power point shall be provided and incorporated in the dash console.

## **MAP LIGHTS**

Two (2) Goose neck style map lights shall be provided and mounted one (1) each side of the cab dash.

## **MIRRORS**

Large, heated, four-way power adjustable and remotely operated mirrors shall be mounted on the front of the cab, providing excellent visibility. Mirrors shall provide a minimum of 60 square inches (38,709 square mm) viewing and incorporate a wide-angle convex mirror. The mirror controls shall be located on the right side for ease of use by the driver.

## **CREW SPACE**

All crew space shall be restricted to the interior of a fully enclosed cab with approved, 3-point restraints.

Where practicable, instruments shall be used in preference to warning lights. If warning lights are used, a means to readily test the condition of all warning light bulbs shall be provided.

Instruments and warning lights shall be displayed so that they will be useful, convenient, and visible to the driver.

The instrument panel(s) shall either be easily removable as units or hinged for back access. Quick disconnect fittings shall be used for all electrical connections to the instrument panel. All instruments, except liquid filled gauges, shall be illuminated. Labels for control and instruments shall be backlit or illuminated.



All rotating or reciprocating parts, all parts with operating temperatures above 120° F (49° C), or that are electrically energized or are of such a nature or so located as to be a hazard to the safety of operating and maintenance personnel during their normal duties, shall be insulated, enclosed, or guarded as appropriate for the specific hazard and its location.

All space that is occupied or from which work is performed during operations, servicing, and maintenance of the vehicles shall be free from hazardous protrusions, sharp edges, cracks, or other elements that might reasonably be expected to cause injury to personnel.

## **RIDE QUALITY**

The vehicle shall be designed so that the ride quality permits the safe operation of the vehicle in on/off road conditions and in adverse terrain that may be encountered on the airfield. If the vehicle is used in an off-road environment the vehicle shall be capable of traveling at speeds up to 35 mph (56 kph) without causing injury to the operating personnel who are properly seat belted in the vehicle and without causing damage to the vehicle itself.

## **CONTROLS**

All the controls necessary for the full operation of the vehicle and for activating the firefighting system shall be within reach of the driver.

Controls for the fire extinguishing system(s) shall also be within easy reach of a second crew station. All cab-mounted controls shall be identified by function and/or limitation with permanent backlit labels.

Firefighting equipment and controls located on the vehicle exterior shall be placed between 24 inches (609 mm) and 72 inches (1,828 mm) above the ground, catwalks, or deck plates, as applicable.

All controls located on the exterior of the vehicle shall be labeled with an illuminated permanent label identifying function and/or limitation.



## **SIREN/PUBLIC ADDRESS SYSTEM**

A multi-tone, multi-volume emergency vehicle warning siren/public address device with speaker and microphone shall be installed. The device shall produce a minimum sound level of 95 dB(A) at 100 feet (30m) directly in front of the vehicle and 90 dB(A) at 100 feet (30m) and 45 degrees left and right of front center.

One (1) siren speaker shall be mounted on the front bumper, or the turret mounting platform and shall be protected from firefighting agent dripping from the bumper turret and water splashed up by the tires.

## **SIREN SWITCHES**

Siren activating foot switches shall be provided for the driver and turret operator.

## **BACK-UP ALARM**

A “vehicle backing” warning device, audible up to 25 feet (7.6 m) behind the vehicle, shall be provided. Shifting the transmission into reverse shall activate the back-up alarm.

## **AIR HORN SYSTEM**

Two (2) Air horns shall be provided and mounted to achieve optimum sound projection to the front of the vehicle.

## **AIR HORN SWITCHES**

One (1) floor mounted foot switch shall be provided on each side floor of the cab for the driver and front passenger crew seat.



## **RADIO EQUIPMENT**

An iCom A-120, Kenwood TK-7180, and Motorola APX 6500 radios will be provided and installed in the cab.

Two (2) master stations will be installed. One (1) in the cab and one (1) at the pump panel. Two (2) iCom IC-A16 handheld radios will be provided with chargers wired into vehicle.

All radio equipment will come with accessories (antenna, microphones, etc) and turn off with the ignition switch.

**NOTE:** The radios quoted above have been provided to meet the Customers bid specifications/addendums. Any radios requiring additional options or options not listed in the Customer bid specification/addendums such as software, trunking or encryption packages shall be an additional cost.

## **ANTENNA TAPS**

The vehicle will be provided with three (3) separate 30 amp circuits with breakers and connections provided in a space adjacent to the driver and turret operator for the installation of Customer provided and installed radios and other communication equipment after the vehicle is delivered to the end user. To facilitate the installation of the communication equipment, three (3) antenna taps shall be provided and installed on top of the cab with cabling run to the center console for the Customer installed radios.

The vehicle shall be provided with radio interference protection in accordance with SAE J551/4, Test Limits and Methods of Measurement of Radio Disturbance Characteristics of Vehicles and Devices, Broadband and Narrowband, 150kHz to 1000MHz, or an equivalent radio interference suppression standard.

Two (2) extension stations will be provided. One (1) installed at the structural pump panel and one (1) installed in the cab.

Two (2) noise cancelling radio transmit headsets with noise cancelling microphones will be provided and installed in the cab and at the pump panel.



## **INSTRUMENTATION DISPLAY**

The vehicle dash cluster instrumentation shall be standard psi.

### **INFORMATION**

- Speedometer (electronic)
- Tachometer (electronic)
- Transmission mode (N / active gear / R)
- Odometer
- Transmission oil temperature
- Coolant temperature
- Dual air pressure (indication and warning)
- Differential locks activated
- Fuel level
- Ad-blue level
- Voltmeter
- Indicator left/right
- Lights (low beam / high beam, fog lights, rear fog lights)
- Engine brake
- Indicator speed
- Indicator pressure
- Indicator temperature

### **WARNINGS**

- Engine oil pressure low
- Coolant temperature high
- Coolant level low
- Transmission oil temperature high
- Park brake engaged
- Fuel level low
- Exhaust system
- Engine check/stop
- ABS deactivated

Warning Sign that states “Occupants must be seated and wearing a seat belt when apparatus is in motion” will be provided in locations that are visible from each seated position in accordance with NFPA 414.



## **CONTROL PANEL FOR FIRE FIGHTING OPERATION**

Control of the firefighting system is done via LCS 2.0 control display within a well-designed menu navigation. All necessary control elements appear as a button in the relevant submenu. A status-LED in combination with the information in the display shows active buttons.

The following buttons are always provided at the display:

- Optical alarm devices
- Acoustic alarm devices
- Pump operation
- Pump operation / manual operation
- Foam operation
- Scene lighting
- Warnings
- System information

Additional service screens in the display contain detailed information regarding engine, gearbox and superstructure.

Activation and deactivation of the fire pump (automatic mode) as well as engine speed adjustment is done via LCS-Digipot (display screen). Pressing the "Start"-button activates an automatic mode (Pump and Roll) with following functions:

- Activation of PTO of torque converter
- Increase engine speed
- Open water tank suction valve
- Engage priming pump (if specified)
- Engine speed is infinitely variable via turn switch.

## **INSTRUMENTATION DISPLAY**

The pump panel digital instrumentation shall be standard psi.

## **DRY CHEMICAL AGENT CONTROL PANEL**

Activation of propellant for dry chemical powder unit via safety switch in cab accessible by both the driver and passenger. One (1) pressure gauge will be mounted in the cab, displaying the vessel pressure of the dry chemical system.



## **INTERIOR CABINETS**

There shall be two (2) interior storage cabinets located one (1) on the floor of the back center portion of the cab and one (1) located under the interior access ladder, both compartments shall be provided with lift up doors with thumb latches.

## **AIR CONDITIONING**

An air conditioning system shall be installed in the cab. The evaporator shall be integrally installed with the heater/defroster unit.

## **DRIVER'S SEAT**

One (1) high back adjustable (fore, aft, up & down) driver seat with integrated Load and Lock SCBA bracket, covered in grey Dura-Wear material and integrated seat belt system shall be installed. The integrated seat belt shall be red in color to provide contrast.

A removable insert to cover the SCBA unit when mounted in seat back shall be supplied.

## **TURRET OPERATOR'S SEAT**

One (1) high back adjustable (fore, aft, up & down) turret operator's seat with integrated Load and Lock SCBA bracket, covered in grey Dura-Wear material and integrated seat belt system shall be installed. The integrated seat belt shall be red in color to provide contrast.

A removable insert to cover the SCBA unit when mounted in seat back shall be supplied.



## **INFRARED CAMERA SYSTEM (FLIR) – PAN AND TILT**

A FLIR (forward looking infrared) Vehicle Vision System shall be installed to provide enhanced visibility for low light or smoky conditions. The camera shall be capable to operate in open ambient air temperatures from -40°C to 80°C.

The FLIR camera shall have pan and tilt capabilities. The FLIR system shall be capable of operation as a driver's aid during low visibility driving conditions.

The FLIR shall provide black hot or white-hot video display.

One (1) FLIR camera shall be mounted on the cab roof.

A 10.4" (264 mm) flip up LCD 1042x768 resolution flat screen monitor shall be provided for the FLIR camera. This monitor shall be used to display the FLIR camera images and/or color camera images as specified elsewhere in these specifications.

## **FLIP UP VIDEO MONITOR**

A flip up monitor shall be provided on the driver's side of the cab dash for viewing of the FLIR image.

## **BACKUP CAMERA**

A backup camera system shall be installed on the vehicle. System shall automatically turn on whenever the vehicle is placed in reverse and shall be able to be switched on manually if desired. The system shall have a dedicated monitor mounted on the cab dash in such a way as to be readily visible to the driver. The system shall be viewable through the LCS mounted in a position on the dash to be readily visible to the driver.

## **FLIP UP VIDEO MONITOR**

A flip up monitor shall be provided on the officer's side of the cab dash for viewing of the FLIR image.



## **MONITORING AND DATA ACQUISITION SYSTEM (MADAS CONNECTED FLEET)**

A Rosenbauer MADAS/Connected Fleet system shall be installed on the vehicle that will allow the monitoring of the following items as specified in the NFPA 414. Installed components from the DWD system must be integrated:

- vehicle speed
- vehicle heading
- lateral acceleration
- vertical acceleration
- longitudinal acceleration and deceleration
- engine RPM
- throttle Position
- steering Input
- vehicle braking input (pedal position and brake pressure)
- date, time, and location for all data collected

The GPS position of the truck shall be stored by the system in addition.

The data acquisition system shall be capable of storing the measurements and the time intervals, starting at least 120 seconds before and ending at least 15 seconds after any serious incident. The system shall be designed so that the data being recorded will not be lost or overwritten immediately after the incident due to the use of an emergency shut-off or a master electrical disconnect switch. System shall be “hot-wired” to the battery system and shall by-pass the normal electrical system. Appropriate software cables and instruments necessary to download and interpret the data shall be provided.

## **CONNECTED FLEET TRANSMIT**

The connected fleet system shall be provided with the option to transmit the operational characteristics of the vehicle for a minimum of one (1) year subscription package chosen by the end user.



## **LATERAL ACCELERATION INDICATOR**

A Rosenbauer Driver Warning Device (DWD) shall be installed providing an in-cab vehicle operator training device inclusive of a lateral acceleration sensor and driver awareness/alarm system. The system shall provide both visual and audio warning signals to the driver as specified in the NFPA 414 and FAA Advisory Circular 150/5220-10.

The system shall provide the ability to set an alarm threshold for the vehicle. The alarm includes an advisory light at each 10% of the threshold with a color change and audio alert up from 70% of the level.

The DWD system shall have at least the following technical ratings:

- wide range DC input from 9 to 30V
- IP65 rating or higher
- Operating temperature from -4°F to +158°F
- TFT visualization display of 3"

## **PUMP COMPARTMENT**

The pump compartment shall be well ventilated and weatherproof.

Vents with a total of at least 10 squares inches (64.5 cm<sup>2</sup>) of ventilation shall be supplied where required.

Drains to allow collected water to run out under the vehicle shall be provided.

The floor of the compartment shall be lined with PVC matting (turtle tile) where applicable.

## **COMPARTMENT WEIGHT LABELS**

All compartments shall be supplied a highly visible, permanently affixed label clearly stating the maximum weight that can be placed in the compartment based upon tilt table certification testing.



## **DRIVERS SIDE UNDERTANK COMPARTMENT**

The undertank compartment shall be well ventilated and weatherproof.

Vents with a total of at least 10 squares inches (64.5 cm<sup>2</sup>) of ventilation shall be supplied where required.

Drains to allow collected water to run out under the vehicle shall be provided.

The floor of the compartment shall be lined with PVC matting (turtle tile) where applicable.

## **PASSENGER SIDE UNDERTANK COMPARTMENT**

The undertank compartment shall be well ventilated and weatherproof.

Vents with a total of at least 10 squares inches (64.5 cm<sup>2</sup>) of ventilation shall be supplied where required.

Drains to allow collected water to run out under the vehicle shall be provided.

The floor of the compartment shall be lined with PVC matting (turtle tile) where applicable.

## **ROLL-UP COMPARTMENT DOORS**

Primary access to vehicle compartments on the vehicle shall be via doors of a rollup design. Doors shall be aluminum rollup non-locking type with a bar latch mechanism to open/close the door. Secondary access to some vehicle storage areas will utilize a hinged panel door design.

## **ROLL UP COMPARTMENT DOORS**

The roll up doors shall be provided with an anodized aluminum finish.

## **SCBA COMPARTMENTS**

Four (4) SCBA storage compartments shall be provided and vertically mounted two (2) each side of the upper pump compartment.

SCBA bottle compartments shall be constructed of aluminum and shall be provided with SCBA bottle scuff protection.



## **REAR ACCESS LADDER**

The rear face engine mod shall be provided with a ladder to access the top of the vehicle. The ladder shall be painted grey in color with the lower portion foldable for increased vehicle angle of departure.

## **FIXED SHELVING**

One (1) fixed shelf shall be provided and mounted on each side of the engine mod compartment.

## **OPEN COMPARTMENT DOOR WARNING SYSTEM**

There shall be an indicator light mounted on the cab dash which will be highly visible during the day or night. This indicator light shall be wired to an audible signal to advise the operator when a compartment door is open. This warning indicator light shall be interlocked with the vehicle's parking brake and shall operate whenever the parking brake is released.

## **HANDRAILS/GUARDRAILS**

Handrails and guardrails shall be provided for personnel safety at all steps and walkways including along the top of the vehicle. The rail material shall be heat and corrosion-resistant and shall be provided with a low-maintenance, durable, and sunlight, weather, heat, and corrosion resistant finish.

## **STEPS, AND WALKWAYS**

All step surfaces, ladder rungs, walkways, and catwalks shall be anti-skid. Anti-skid deck plating shall be provided on the top of the vehicle.

The height between steps shall be less than 20 inches (508 mm). The lower steps shall be 22 inches (558 mm) or less from the ground in the loaded condition. The tread of the bottom steps shall be at least 8 inches (203 mm) in width and succeeding steps at least 16 inches (406 mm) in width. The full width of all steps shall have at least 6 inches (152 mm) of unobstructed toe room or depth when measured from and perpendicular to the front edge of the weight-bearing surface of the step.



## FIRE PUMP

The ROSENBAUER N80 fire pump meets and exceeds the stringent requirements of NFPA and is listed by Underwriters Laboratories (UL).

Make:	ROSENBAUER
Model:	N80
Material:	High strength corrosion resistant light alloy impeller and housing. Pump shaft to be stainless steel. Pump is mechanically sealed.
Drive:	By power divider
Rated capacity:	2100 gpm @ 220 psi (15 bar) tank suction operation
Number of stages:	1
Location:	In pump compartment. Pump is mounted lower than the water tank to assure gravity priming. A priming pump is supplied as standard to assist pump priming if needed
Suction line to tank:	Pneumatic actuated butterfly valve
Automatic Overheat Protection:	The pump shall be equipped with an automatic overheat protection device to prevent the pump from overheating when running the pump without discharging water (dead heading). The automatic overheat system shall monitor the water temperature inside the pump and automatically open a valve to discharge water and cool the pump. The overheat protection system will automatically reset after the water temperature has reached normal operating temperature. A visual water pump overheat indicator shall be provided in the cab.



## **PRIMING DEVICE**

The fire pump is equipped with a ROSENBAUER KAP priming device as a standard. This allows to air evacuate the piping system quickly and also provides excellent drafting capabilities. The priming device is capable of automatic operation if the water pump requires it or can be manually operated if needed. Controls are provided in the cab and on the structural panel for manual operation.

Make:	ROSENBAUER
Model:	KAP
Type:	High speed, double piston priming pump,
Actuation:	Automatic and Manual
Drive:	Via tooth belt from main pump shaft
Suction performance:	Up to 24 ft. (7.3 m), attainable vacuum up to 96%

## **HEAVY GAUGE CORROSION RESISTANT STEEL PIPING**

All pipe work is manufactured from heavy-gauge, corrosion resistant, hot dip galvanized steel pipe and tubing to minimize corrosion. Each pipe is pressure tested prior to assembly and the complete system is pressure tested during pumping tests.

## **MAIN SUCTION INLET**

One (1) 5" (125 mm) gated suction inlet on the left side with 5" (125 mm) shall be installed.

A drain for bleeding air and water from the lines shall be installed.

## **AUXILIARY SUCTION INLET**

One (1) 2 1/2" (65 mm) gated suction inlet adjacent to the main suction on the left side with 2 1/2" (65 mm) NST female swivel connection and plug shall be installed.

A drain for bleeding air and water from the lines shall be installed.

## **PLUG**

The 2 1/2" inlet shall be provided with a 2 1/2" plug with cable.



## **ADAPTER**

A 5" storz adapter with cap shall be provided.

## **LEFT SIDE DIRECT TANK FILL**

One (1) 4" gated tank fill shall be provided located within the left side of the pump module next to the main pump intake with 4" (100 mm).

## **ADAPTER**

A 5" storz adapter with cap shall be provided.

## **LEFT SIDE DISCHARGE**

One (1) 2 ½" (65 mm) NSTM discharge shall be installed on the left side.

The discharge shall be equipped with a 2 ½" (65 mm) NST 30° elbow.

The discharge shall be equipped with a 2 ½" (65 mm) NST cap.

The discharge shall be equipped with a liquid filled 2 ½" (65 mm) gauge installed adjacent to the discharge or discharge control.

A drain for bleeding air and water from the lines shall be installed.

Foam metering for this discharge shall be provided by the Fix Mix around the pump foam proportioner.



## **RIGHT SIDE DISCHARGE**

One (1) 2 ½" (65 mm) NSTM discharge shall be installed on the right side.

The discharge shall be equipped with a 2 ½" (65 mm) NST 30° elbow.

The discharge shall be equipped with a 2 ½" (65 mm) NST cap.

The discharge shall be equipped with a liquid filled 2 ½" (65 mm) gauge installed adjacent to the discharge or discharge control.

A drain for bleeding air and water from the lines shall be installed.

Foam metering for this discharge shall be provided by the Fix Mix around the pump foam proportioner.

## **LEFT SIDE PRE-CONNECTED SOFT JACKET HANDLINE**

One (1) quick attack, pre-connected soft jacketed handline shall be provided.

The handline shall be installed on the left side of the vehicle in an enclosed compartment for easy access.

The handline will be equipped with an "auto-charge" device that will allow a single firefighter to safely deploy the handline without needing to return to the vehicle to charge the handline.

Pre-connected handline shall be capable of flowing a minimum of 95 gpm (359 lpm) per NFPA 414 utilizing 200' (60 m) of 1 ¾" hose.

## **NOZZLE**

The handline shall be equipped with an adjustable gallonage pistol grip nozzle with NST thread.

## **HOSE**

200 ft (60 m) of 1 ¾" rubber-lined, soft, double-jacketed hose with NST thread shall be supplied with the vehicle in 50-foot (15 m) lengths.



## **PRE-CONNECT MOUNTING**

The pre-connect handline shall be mounted on the floor of the compartment with turtle tile to allow drainage.

## **RIGHT SIDE PRE-CONNECTED SOFT JACKET HANDLINE**

One (1) quick attack, pre-connected soft jacketed handline shall be provided.

The handline shall be installed on the right side of the vehicle in an enclosed compartment for easy access.

The handline will be equipped with an “auto-charge” device that will allow a single firefighter to safely deploy the handline without needing to return to the vehicle to charge the handline.

Pre-connected handline shall be capable of flowing a minimum of 95 gpm (359 lpm) per NFPA 414 utilizing 200' (60 m) of 1 3/4" hose.

## **NOZZLE**

The handline shall be equipped with an adjustable gallonage pistol grip nozzle with NST thread.

## **HOSE**

200 ft (60 m) of 1 3/4" rubber-lined, soft, double-jacketed hose with NST thread shall be supplied with the vehicle in 50-foot (15 m) lengths.

## **PRE-CONNECT MOUNTING**

The pre-connect handline shall be mounted on the floor of the compartment with turtle tile to allow drainage.



## **STRUCTURAL CONTROL PANEL**

A structural package is standard on all Rosenbauer vehicles. The fully operational structural panel is located on the left-hand side of the vehicle and shall be mounted in the vehicle pump compartment and shall be provided with:

- e. Switch for water tank suction valve
- f. Switch for foam tank suction valve
- g. Switch for foam proportioning rate
- h. Electronic discharge pressure gauge (Pressure Governor System)
- i. Electronic intake pressure / vacuum gauge (Pressure Governor System)
- j. Indicator lamp for water tank suction valve open
- k. Indicator lamp for foam tank suction valve open
- l. Indicator lamp for priming pump operating
- m. High water temperature warning light
- n. Low oil pressure warning light
- o. Control lamp for PTO
- p. Switch for flushing
- q. Switch for priming pump
- r. Electronic Pressure Governor Control System with the following:
  - OK to Pump indicator
  - Electronic tachometer
  - Electronic Intake Pressure Gauge
  - Electronic Discharge Pressure Gauge
  - Idle button
  - Preset pressure
  - Engine Coolant Temperature Gauge
  - Engine Oil Pressure gauge

## **PSI PUMP PANEL GAUGES**

The discharge gauges and pressure governor control system (PSG) shall read in PSI.

## **BUMPER TURRET**

A Rosenbauer RM35 multi-position, high volume, low attack (HVLA) bumper turret with an automatic water/foam nozzle shall be provided. The turret will include the following features:



## **NOZZLE SWEEP ASSEMBLY**

The nozzle sweep assembly shall consist of a double swivel joint allowing the nozzle to sweep in both horizontal and vertical planes. Internal turning vanes shall be cast into the assembly for more efficient flow. The elevation axis shall allow the nozzle to be elevated 90° or depressed 45° either side of center for a 135° vertical sweep (plus 180° rotation to park position).

The horizontal axis rotation shall allow the nozzle to be directed either side of center for up to 180° sweep.

Both horizontal and vertical drive motors shall be electric with current limiting motor protection.

## **NOZZLE**

The nozzle shall have an automatic flow mechanism that maintains consistent pressure and includes a self-draining baffle mechanism with a water/foam dual flow range calibrated to primary turret flow requirements specified by NFPA 414 – latest edition. The nozzle must maintain a constant flow throughout the flow range in straight stream through wide fog patterns.

The nozzle shall be a non-air aspirating type with electric pattern actuation to select straight stream or dispersed pattern discharge. The nozzle shall meet or exceed the straight stream distance and pattern spray as specified by NFPA 414 – latest edition.

The nozzle shall be equipped with an automatic leveling device that will keep the nozzle parallel to the ground regardless of boom position.

## **MULTI-FUNCTION CONTROLS**

A multi-function remote nozzle control with auto-oscillation shall be provided, joystick type. The controller shall have dual axis motion plus soft touch switches for discharge functions. Left and right motion shall control horizontal sweep. Forward and back motion shall control vertical sweep.

Joystick switch functions shall include the following operations:

### Switches

Water/Foam Discharge “ON” and “OFF”

“FOG/STRAIGHT STREAM” selection

Auxiliary Agent Discharge “ON” and “OFF”

Boom “UP and DOWN” function

“HIGH/LOW” Flow selection

Highly visible indicators shall be provided for High/Low flow position and nozzle Auto-Level “ON”. These indicators shall be positioned so that they can be seen by the operator while keeping his eyes focused on the nozzle discharge.



## **BOOM DESIGN**

The nozzle assembly shall be attached to a boom mechanism made of heavy wall stainless steel for long life and corrosion resistance. The nozzle and mounting assembly shall be adequately reinforced to sustain all anticipated loads and reaction force of the volume nozzle.

The boom mechanism shall be capable of lowering the nozzle to near ground level or elevating the nozzle to 30° above horizontal. Boom “UP” and “DOWN” positioning shall be by momentary switches on the joystick control handle.

The boom and nozzle shall be capable of folding up and into a PARK position to provide minimum protrusion from the front of the vehicle and maximum driver visibility. This position shall also maintain the 30° angle of approach.

The boom shall move by means of an electric-hydraulic pump and hydraulic cylinder. The lift system shall be self-contained and connect directly to the chassis electrical system. Holding valves shall be installed to prevent boom drift when the hydraulic system is turned off.

## **DRY CHEMICAL NOZZLE**

The bumper turret shall be provided with a Rosenbauer Chem Core dry chemical nozzle meeting the requirements set forth in NFPA 414.

## **TURRET LIGHT**

One (1) High Intensity (LED) light shall be attached to the nozzle assembly. Lights shall rotate and elevate with nozzle movement to provide illumination of the water/foam stream.

## **ROOF TURRET**

A Rosenbauer RM35 Dual Flow roof turret shall be provided. A single joystick control and all necessary switches are grouped within comfortable reach of driver and co-driver and mounted on the center console.



## **NOZZLE SWEEP ASSEMBLY**

The nozzle sweep assembly shall consist of a double swivel joint allowing the nozzle to sweep in both horizontal and vertical planes. Internal turning vanes shall be cast into the assembly for more efficient flow. The elevation axis shall allow the nozzle to be elevated 90° or depressed 45° either side of center for a 135° vertical sweep (plus 180° rotation to park position).

The horizontal axis rotation shall allow the nozzle to be directed either side of center for up to 180° sweep.

Both horizontal and vertical drive motors shall be electric with current limiting motor protection.

The nozzle attachment shall place the nozzle forward off the windshield for improved visibility and to lessen the effects of foam overspray.

## **NOZZLE**

The nozzle shall have an automatic flow mechanism that maintains consistent pressure and includes a self-draining baffle mechanism with a water/foam flow range specified by NFPA 414. The nozzle must maintain a constant flow throughout the flow range in straight stream through wide fog patterns.

The nozzle shall be a non-air aspirating type with electric pattern actuation to select straight stream or dispersed pattern discharge. The nozzle shall meet or exceed the straight stream distance and pattern spray as specified by NFPA 414 – latest edition.

The position of the nozzle shall be visible to the operator at all times. Indicators or point-arm controls shall not be required.

## **MULTI-FUNCTION CONTROLS**

A multi-function remote nozzle control with auto-oscillation shall be provided, joystick type. The controller shall have dual axis motion plus soft touch switches for discharge functions. Left and right motion shall control horizontal sweep. Forward and back motion shall control vertical sweep.

Joystick switch functions shall include the following operations:

### Switches

Water/Foam Discharge “ON” and “OFF”

“FOG/STRAIGHT STREAM” selection

Auxiliary Agent Discharge “ON” and “OFF”

“HIGH/LOW” Flow selection



## **TURRET LIGHT**

One (1) High Intensity (LED) light shall be attached to the nozzle assembly. Lights shall rotate and elevate with nozzle movement to provide illumination of the water/foam stream.

## **WATER TANK**

Construction: Heavy-Duty polypropylene

Baffle plates: Longitudinal, horizontal plus transversal. Baffling is provided to compartmentalize the tank minimizing “sloshing” of the tank in less than full conditions allowing for increased vehicle stability.

Fill Tower: Quick Opening Lid

Overflow Vent: Provided

Tank drain: 2" (50.8 mm) actuation from the side of the vehicle terminating 1 1/2" storz.

Tank sump: Of sufficient size to minimize swirl.

Design features: Structural integrity to withstand internal and external loads.

Best utilization of space for keeping vehicle's dimensions compact, and center of gravity as low as possible.

Excellent strength to weight ratio.

The water tank assembly shall be directly attached to the chassis with flexible rubber-steel elements. Bending and torsion loads transmitted from the vehicle frame are absorbed in those rubber steel elements.

The tank is mounted with stress isolating rubber cone bearings on the chassis frame rails. It provides optimum weight distribution on the axles assuring the required soft soil mobility and maximum traction for cross-country travel.

Non-slip walkway is fitted on top of the vehicle on all walkways.

## **TANK CAPACITIES**

The water tank capacity shall 1600 gallons and the foam tank capacity shall be 210 gallons.

The foam concentrate tank shall have a working capacity sufficient for two tank loads of water at the maximum tolerance specified in NFPA 412.



## **FIRE EXTINGUISHING SYSTEM - FOAM CONCENTRATE SYSTEM**

A fully automatic ROSENBAUER foam admixing system is provided. The system is completely pre-calibrated at the factory during the initial test procedure. A test report shall be provided. The metering rate can be changed during operation of the foam system without interruption or recalibration by operating a switch in the cab or on the exterior pump panel.

Depending on the rate of discharge (GPM) from the water pump, the check valve in the control unit is activated and transfer rods adjust the metering valve to deliver foam concentrate to the eductor on the intake side of the water pump.

The metering valve regulates the exact quantity of foam concentrate to be added. During all stages of operation, a non-return valve in the foam concentrate suction line prevents water from entering the foam concentrate tank.

The system is designed for use of protein and synthetic foam concentrates as well as AFFF.

In addition to the foam main line from the foam tank there is an outside source connection, which can be used to draft foam concentrate from a container, directly into the proportioning system bypassing and preserving the onboard foam tank if needed.

Foam concentrate metering is fully automatic. The system induces a pre-selected percentage of concentrate constantly depending on the GPM flowed through the discharge side of the water pump. Change in agent discharge and agent pressures will not affect the pre-selected percentage on proportioning.

If the vehicle is re-circulating water back to the tank and the foam system is activated, the recirculation valve automatically closes to prevent foam concentrate from entering the water tank.

A system flushing mode is provided in order to clean foam concentrate from the firefighting piping system by means of inducing clean water downstream of the foam tank suction valve and discharging through the monitor or other discharge lines. An interlock system is incorporated to ensure that the flushing valve is in the closed position when the main foam valve is open.

The ROSENBAUER FIX MIX works fully mechanically, is maintenance-free, requires no adjustment to the system and does not make use of any electronic or electric components for unmatched reliability.



## **FIRE EXTINGUISHING SYSTEM - FOAM CONCENTRATE SYSTEM**

An electronically regulated, fully automatic ROSENBAUER foam admixing system shall be provided. The system is completely pre-calibrated at the factory during the initial test procedure. A test report shall be provided upon delivery of the completed vehicle. The foam metering rate shall be able to be changed during operation of the foam system without interruption or recalibration by operating a switch in the cab or on the exterior pump panel.

Manufacturer: ROSENBAUER

Model: FIXMIX 2.0 E

Type: Around-the-Pump Automatic Foam Proportioner (electronically regulated, mechanically pre-controlled) with selectable variable rate proportioning (1%, 3%, 6%)

Foam delivery: 1.3 – 132 gpm (5-500 lpm)

Usability: For all types of Class B - foam concentrate including AFFF

Admixing rate: Between 0% and 6% adjustable

Standard setup: 1%, 3% and 6% Usability: for all foam compounds with a viscosity up to 60 cSt (foam compounds with higher viscosity available on request)

The water cone in the pump discharge opens according to the rate of discharge (GPM) from the water pump. A potentiometer measures the movement of the cone and calculates the water flow. The cone is connected with a rod to the foam dosing disc, that meters the foam according to the water flow. In addition, a bushing with an opening will be turned by an electric motor according to the chosen proportioning rate. The foam concentrate is then delivered to the eductor on the intake side of the water pump. The foam flow is constantly controlled by a magnetic inductive flow meter in the foam suction line. If there is an offset, the electric motor will be adjusted accordingly.

The system is pre-adjusted by the water cone and will be fine-tuned with the electronic controls.

During all stages of operation, a non-return valve in the foam concentrate suction line prevents water from entering the foam concentrate tank.

The system is designed for use of protein and synthetic foam concentrates as well as AFFF.

In addition to the foam main line from the foam tank there is an outside source connection, which can be used to draft foam concentrate from a container, directly into the proportioning system bypassing and preserving the onboard foam tank if needed.



Foam concentrate metering is fully automatic. The system induces a pre-selected percentage of concentrate constantly, depending on the GPM flowed through the discharge side of the water pump. Change in agent discharge and agent pressures will not affect the pre-selected percentage on proportioning.

If the vehicle is re-circulating water back to the tank and the foam system is activated, the recirculation valve automatically closes to prevent foam concentrate from entering the water tank.

A system flushing mode shall be provided in order to clean foam concentrate from the firefighting piping system by means of inducing clean water downstream of the foam tank suction valve and discharging through the monitor or other discharge lines. An interlock system is incorporated to ensure that the flushing valve is in the closed position when the main foam valve is open.

The ROSENBAUER FIXMIX 2.0E works mechanically with electronic control and is maintenance-free and requires no adjustment to the system.

During foam operation the water and foam flow will be shown in the main display.

## **ON BOARD FOAM TESTING SYSTEM**

Manufacturer: ROSENBAUER

Model: Foam Test System

Requirement: FIXMIX 2.0 E

In lieu of using foam concentrate, the FIXMIX 2.0 E will be operated with water. The pump/foam system shall be plumbed to allow foam testing by pushing a button on the cab operation panel.

The system measures the water flow and the simulated foam flow (with water) when discharging through an outlet.

The two flows and the proportioning rate will be displayed on the LCS monitor located in the cab.

With this option it is possible to check the system without using foam.



## **FOAM DRAFT CONNECTION**

A foam draft connection terminating in 1 1/2" storz shall be provided on the left side of the vehicle for the drafting of foam to the Fix Mix foam system from an external source.

## **FOAM FILL/DRAIN**

One (1) 1 1/2" (38 mm) storz fill connection with manually operated ball valve and internal strainer shall be located on each side of the vehicle.

## **110 VAC FOAM TRANSFER PUMP**

A 110-VAC electrically operated foam transfer pump shall be supplied for the loading and off-loading of AFFF foam concentrate. The pump shall be supplied with 1 1/2" [38mm] Storz connections.

The pump assembly shall be portable and be supplied with a vehicle type mounting bracket in a compartment.

The pump shall have a 3' three prong household type electrical plug and have an on/off switch located on the pump.

There shall be two and clear spiral wire reinforced hoses supplied to allow transfer from bulk barrel containers to the vehicle foam tank.

The suction hose shall have a 1 1/2" [38mm] connection on one end and be open on the opposite end for insertion into a foam container. The suction hose shall be 84" long.

The discharge hose shall have two 1 1/2" [38mm] connections and be 48" long.

## **FOAM CONCENTRATE**

The foam provided shall be 3% AFFF Mil-spec.



## **FOAM CONTAINER**

((4)) 55-gallon (208 liter) drums shall be provided with the vehicle.

====No Additional Foam Required====

## **DRY CHEMICAL SYSTEM**

A Fire Combat 500 lb. (225 kg) Dry Chemical system shall be furnished and installed on the vehicle complete with nitrogen cylinder(s), dry chemical reservoir, and all necessary plumbing components. Controls for the charging of the dry chemical system shall be located in the cab and shall incorporate gauges to indicate nitrogen vessel storage pressure and system charged pressure. Blow-down and re-servicing valves shall be supplied and incorporated in the system plumbing. A fill opening shall be supplied on the top of the vehicle allowing the dry chemical reservoir to be filled without the need to remove any piping or accessory.

A nameplate, clearly indicating Blow-down and Re-servicing instructions shall be mounted in the compartment adjacent to the system.

One (1) nitrogen cylinder with internal pressure gauge shall be mounted on the vehicle.

## **DRY CHEMICAL AGENT**

((9)) 50-pound (22 kilograms) containers of Chem-Guard Purple K potassium based dry chemical shall be provided with the vehicle.

## **SPARE CHARGING CYLINDER**

One (1) spare nitrogen cylinder shall be supplied and shipped loose with the vehicle.

## **FIXED HOSE REEL**

The reel shall be fix mounted in a compartment on the right side of the vehicle.



## **TWIN AGENT REEL**

A “twinned” dual agent hose reel capable of simultaneously discharging dry chemical and water or water/foam solution shall be provided in a compartment of the vehicle. The reel shall be supplied with a DC electric rewind. Once the dry chemical system has been charged with the in-cab controls, controls for the operation of the dry chemical system shall be located near the “twinned” dual agent hose reel. Controls for the charging of the dry chemical system shall be located at the reel.

## **BOOSTER HOSE**

The reel shall have a capacity of 100’ of “twinned” 1” rubber “booster” type hose for water/foam and dry chemical use.

## **DRY CHEMICAL NOZZLE**

The dry chemical hose reel discharge shall be supplied with a Williams HYDROCHEM hand-line nozzle capable of discharging chemical agent concentrically entrained with-in the water or water/foam solution.

## **PROPELLANT CYLINDER LIFTING SYSTEM**

An electric winch system shall be provided to assist in installation and change of the agent propellant cylinder. The lift system shall meet the intent of FAA and NFPA guidelines whereas to allow for servicing by one (1) person standing from ground level.

## **CHASSIS ELECTRICAL SYSTEM**

Starter:	24 Volt DC starting
Chassis lighting	24 Volt DC lighting
Maintenance Switch:	A battery disconnect-isolator switch is provided and shall be mounted near the batteries. The switch will prevent starting of the vehicle during maintenance and will be wired so as to not interrupt the major power supply to the vehicle's starter.
Remote voltmeter:	A remote voltmeter energized by a switch shall be provided adjacent to the auto eject shoreline.



## **ALTERNATOR**

A high capacity 24-volt 150-amp alternator shall be provided meeting FAA 5220-10E and NFPA 414. The alternator shall include warning light in the cab to indicate alternator failure.

## **BATTERY SYSTEM**

Two (2) 12-volt maintenance-free batteries with frame rail mounted carrier on left rear side of vehicle wired in series 24 volt. The system shall have sufficient cold cranking battery capacity that meets the engine manufacturer's recommendation for the lowest ambient starting temperature.

## **JUMP/CHARGING STUDS**

Battery jump studs shall be installed on the exterior rear area of the vehicle near battery box.

## **COOLANT HEATER**

A 110 volt coolant heater shall be provided and plumbed in the coolant system to aid in cold weather starts.

The heater shall be wired to the shoreline.

## **110V BATTERY CONDITIONER**

A 110-VAC battery conditioner shall be furnished and installed on the vehicle. The battery conditioner shall be wired to maintain the chassis battery system when the vehicle is parked.

## **110V AUTO-EJECT QUICK DISCONNECT**

One (1) 20-amp Kussmaul Super 20 Auto-Eject quick disconnect plug/socket for the required on-board electrical components shall be installed at the rear left side of the vehicle.



## **WIRING**

All wiring shall be numbered or color or function-coded for proper identification. Wiring shall be of stranded conductors and of a wire gauge commensurate with the anticipated maximum electrical load of the circuit.

Wires shall be insulated in accordance with the applicable standards of the Society of Automotive Engineers (SAE).

All connections shall be made with lugs or terminals mechanically secured to the conductors.

Wiring shall be secured in place and protected from heat, oil, lubricants, fire- fighting agents, and physical damage. Appropriate circuit breakers shall be provided. Circuit breaker panels shall be easily accessible for service. A copy of this diagram shall also be included in the maintenance manual.

Where wiring passes through sheet metal or structural components, rubber grommets shall be used to protect wiring and wiring looms. Precaution must be taken in all areas to guard against chafing or excessive strain.

## **PNEUMATIC HOSE REEL**

An air hose reel with 200' of 3/8" (9.5 mm) inside diameter hose shall be supplied and mounted from the ceiling of the engine mode compartment on the right side of the vehicle. The connection will be supplied with a quick disconnect, Milton #777 female connector. Reel shall have electric rewind capability and shall have rollers attached to prevent chafing and to aid in deployment.

## **AIR AUTO-EJECT**

A Kussmaul Auto-Eject air connection shall be supplied on the left side rear exterior of the vehicle to permit charging of the air tanks from an external air source.



## **EMERGENCY WARNING LIGHT SYSTEM**

The vehicle shall have a custom integrated warning light system that conforms to the parameters of NFPA 414 and FAA Advisory Circular #150-5220-10E and shall consist of the following:

Rosenbauer will provide an upper and lower emergency lighting system custom designed for the vehicle that is integrated into the body structure to provide illumination in a 360 pattern around the vehicle. The lighting system shall consist of high intensity LED flashers set in a varying flashing pattern.

Integrating the lighting system into the body structure eliminates the need to position varying styles of light bars on the vehicle and the utilization of LED flashing units assures high visibility, minimal maintenance and long bulb life.

## **WARNING LIGHT COLOR**

The lights shall be red in color.

## **LOWER WARNING DISSABLE SWITCH**

A switch shall be provided in the cab to disable the lower warning lights

## **AIR TRAFFIC WARNING LIGHTS**

Two (2) amber LED lights shall be mounted on top of the vehicle, one (1) at the left front and one (1) at the right rear.

## **VEHICLE RUNNING LIGHT SYSTEM**

Lower vehicle clearance marker lights, with reflectors shall be furnished and installed.

## **HEADLIGHTS**

Four (4) Front high intensity head lamps w/ high/low beam (two pairs).



## **WIG-WAG HEADLIGHT FLASHER**

A wig-wag flasher shall be installed in the headlights. The wig-wag headlight flasher shall activate when the vehicle parking brake is released, and the Master Warning Light Switch is "ON".

## **CAB INTERIOR LIGHTS**

Three (3) interior cab dome lights selectable between red and white lens illumination and capable of manual or automatic operation shall be installed.

## **BRAKE/TAILLIGHTS**

Red LED rear face upper lights with reflector shall be installed. These lights shall function as stop lights and taillights.

## **REVERSE LIGHTS**

Two (2) LED white, reversing lights shall be installed. These lights shall illuminate when the vehicle transmission is placed in reverse.

## **DIRECTION INDICATING LIGHTS**

LED directional (signal) indicators front and rear shall be installed. These lights shall also function as road hazard warning lights.

## **LICENSE PLATE**

A lighted license plate bracket shall be installed at the front and rear.

No Fog Lights (Provide Cover)



## **COMPARTMENT LIGHTS**

Each compartment will be supplied with weatherproof LED strip lights that are switched to automatically light when compartment doors are opened, and the vehicle master switch is in the “on” position. This includes pump, undertank, and engine compartments.

## **UNDER TRUCK LIGHTING**

Under truck lights shall be provided under the engine module allowing proper area work lighting around the rear of the vehicle. The system shall be wired to the vehicle’s parking brake to activate whenever the parking brake is set.

Under cab lighting shall be provided wired to activate with the cab doors opening when the interior cab dome light is in the door/center position.

## **DECK and WORK LIGHTS**

Upper deck of the truck and work surface lighting around the vehicle shall be provided. The system shall be wired to the vehicle’s parking brake to activate whenever the parking brake is set.

## **FORWARD SCENE LIGHTS**

Two (2) 24V-DC powered LED scene lights shall be mounted on the forward cab roof to provide illumination of the work areas forward of the vehicle. These lights shall be operated by a single cab mounted switch.

## **LED SCENE LIGHTS**

A total of four (4) high mounted 24-volt LED floodlights shall be provided and mounted two (2) each side of the vehicle controlled from a switch in the cab.



## **VEHICLE GENERATOR SYSTEM**

The vehicle shall be provided with a 10KW 120/240V AC diesel generator system with the following components:

The system shall be controllable from the cab via a low voltage switch with an indicator to advise of the system's operation. In the event of a malfunction, the system shall automatically shut down. All high voltage wiring shall be contained in conduit and shall be tied to a circuit breaker box. The high voltage system shall meet all national electrical codes and shall be NEMA compliant.

The auxiliary power system shall include:

- FROG meter (indicates system operation, hertz and voltage being supplied by generator).
- Circuit breaker box.
- Wiring and switches as required.

## **SIDE SCENE LIGHTS**

Two (2) 220V-AC powered LED Fire Research Spectra 20k lumen scene lights shall be mounted one (1) each side of the vehicle to provide illumination of the work areas adjacent to the vehicle. These lights shall be operated by a single cab mounted switch.

## **ELECTRIC CORD REEL**

One (1) electric cord reel 200 ft (61 m) of 12/3 safety yellow wiring shall be provided. Reel shall be tied to a 20-amp circuit breaker. The cord reel shall have a DC electric rewind motor and shall be mounted in a compartment on the left side of the vehicle. The cord reel shall have a means of manually rewinding if needed. The cord reel will be supplied with a roller system to prevent chafing of the cord and to aid in its deployment. The cord shall be terminated in a twist lock plug conforming to NEMA L5-20.

## **LIGHTED WEATHERPROOF JUNCTION BOX**

A weatherproof junction box with lighted indicator shall be provided with a L5-20 receptacle plug to be used with the cord reel.



## **JUNCTION BOX OUTLETS**

Four (4) outlets shall be provided in the junction box. Two (2) 15-amp twist lock and two (2) 15-amp household.

## **120V WEATHERPROOF OUTLETS**

Two (2) 120 VAC 15-amp duplex receptacles w/ weatherproof covers shall be provided one (1) each side of the vehicle engine mod. The receptacles shall be wired to individual circuit breakers and shall be a combination 15-amp household and 15-amp twist lock receptacles.



## **Rosenbauer Specification Clarifications**

Rosenbauer would like to provide the following clarifications for the Emmet County ARFF Unit at Pellston Regional Airport to ensure transparency with our bid proposal. Rosenbauer meets all NFPA 414 Standards for ARFF Units and every component of the Emmet County RFP; however, would like to expand on points of emphasis in several areas of the specifications.

A virtual preconstruction conference will be provided to ensure the Panther ARFF unit being built by Rosenbauer meets the needs of Emmet County.

The Rosenbauer Panther is powered by a Volvo Penta D16 Industrial 700 hp Tier 4 final emission engine. This engine is used in heavy industrial machinery all across the globe. The Volvo Penta engine was selected by Rosenbauer due to its high performance, low maintenance and large network of service facilities.

Walstrom Marine is the warranty service center for Volvo Penta and is located in nearby Harbor Springs and Cheboygan. This provides two service centers located in close proximity to Pellston Regional Airport. These service centers will help to reduce potential unit down time and provide reliable maintenance support for the life of the vehicle. The warranty for the engine is two full years regardless of hours or miles.

The engine diagnostics is linked directly to the Panther Logic Control System (LCS) screen located on the dash. This provides the data that can be cross referenced in the Volvo operator's manual or provided to the nearby service centers for immediate diagnostic capabilities. Additional cables or computer systems are not necessary. The Panther also has a hinged dash that pops up for quick and easy access to instruments, radios and other equipment mounted on the center console. This feature is unique to Rosenbauer and provides unmatched accessibility to an important part of the vehicle's operational equipment.

Firefighting system diagnostic capabilities are also integrated within the vehicle LCS screen and readily available to the driver and maintenance personnel. To enhance this capability, Rosenbauer is providing a one-year subscription to our Connected Fleet program. This program provides an app for firefighters to use when conducting daily and weekly vehicle checkouts. The system provides maintenance notifications and includes remote monitoring with warnings from the vehicle being sent directly to Rosenbauer and specified Emmet County personnel. The Connected Fleet offers additional features, all designed to enhance the vehicle operation, reduce down times and lengthen lifespan.

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Rosenbauer takes pride in the ease of maintainability we have designed into the Panther ARFF unit. To provide added value in the maintenance area, Rosenbauer will offer Emmet County the opportunity to become a warranty service center for your Panther ARFF unit. This would allow the airport to receive reimbursement for any work performed and reduce potential down time of the vehicle.

Rosenbauer has a specialized team of ARFF maintenance personnel that respond directly to the airport to address any concerns with the Panther ARFF unit. These personnel are located across North America for rapid response to address concerns. One of these highly qualified personnel is located in Muskegon, MI. This means you are just a short driving distance for maintenance repairs to your ARFF unit by one of our dedicated Panther technicians.

A Panther maintenance training course at the Rosenbauer manufacturing facility is available and will be offered at a reduced price to enhance Emmet County's capability to maintain the Panther ARFF unit during, and after, the warranty period.

The value of the high-performance coil spring suspension system (HPCSS) only available on the Rosenbauer Panther cannot be understated for off-road vehicles meeting the stringent testing requirements of NFPA 414. Tire travel exceeds that of an independent suspension and provides for a lower roll over point to enhance personnel safety. Wear on tires is reduced with this type of suspension, as shown via Federal Aviation Administration test data. The HPCSS allows operators to drive the vehicle at maximum speeds when full or empty of agent, which is a tremendous benefit if the ARFF units must go any distance to reservice. Some competitor suspension types only support low speed travel when there is no weight provided from agents.

Michelin tires have been specified on your Rosenbauer Panther. This brand is considered among the best in the industry, so it is important to point out you are getting the highest quality products with your Rosenbauer Panther.

Additionally, due to the cold weather climate in Emmet County, an automatic tire pressure monitoring system has been included at no additional cost. This system does not require special tires, rather uses a pressure sensing cap crewed onto the valve stem. It continuously monitors and provides driver feedback on each tire pressure, sending an audible warning when a tire pressure is too low. This system will enhance the vehicle safety, since low tire pressure is sometimes found to be a contributing factor in roll over incidents. It will also maximize the life of the tires by maintaining optimal pressures, which can be a huge cost savings over the lifespan of the vehicle.

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Personnel safety is extremely important and Rosenbauer put an emphasis on this area when designing the Panther ARFF unit. Rosenbauer is the only manufacturer that provides anti-skid staircase style entry steps rather than steps configured directly vertical with each other, which can be easy to miss. This is extremely important for personnel safety when entering and exiting the vehicle, especially in protective gear.

Additional safety features include all personnel grab points around the vehicle are orange in color for easy identification. Access to the engine compartment is provided on both sides of the vehicle with a large platform for maintenance personnel to work safely and comfortably. This platform is also useful for personnel retrieving equipment from these large compartments.

The Rosenbauer Panther has one of the largest windshields in the industry for unmatched visibility. The vehicle doors are constructed of shatterproof safety glass to provide full visibility on each side of the cab all the way to the ground. A cab roof window is also provided to increase visibility for the roof turret operations. Additionally, the Panther was put through rigorous crash testing to ensure safety of the cab occupants. The Panther cab has been frontal impact and roll over crash tested, meeting the stringent requirements of ECE certification.

Another feature unique to Rosenbauer is the hinged center console. This feature allows the occupants to lift the center console to easily ingress or egress the vehicle from either side.

A throttle control knob is available in the cab for the operator to control the pump pressure without having to exit the vehicle and make adjustments at the pump panel. This feature is highlighted because it may not be available on other manufacturer units. This can be helpful in washdown or decontamination type of activities. Another capability unique to the Rosenbauer operation is the ability to perform the input-based foam testing without having to leave the cab. This testing feature is only available via an external foam testing system from one competitor and via the exterior pump panel from another.

Rosenbauer uses our own lateral force alerting device which is an improvement on the LG Alert system. The Rosenbauer visual indicator is located in the instrument cluster on the speedometer. The system has an amber visual warning that changes to red with audible alert at higher limits. The Rosenbauer system does not alert when hitting bumps and other situations not related to lateral force concerns that often happens with the LG Alert system. This is a great upgrade to an important safety feature. It is worth adding a Rosenbauer Panther has never been involved in a roll over. This is due to the enhancement of this alerting feature along with the HPCSS low roll over point, all developed to enhance the safety of the Panther ARFF unit.

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The LCS monitoring system is tied independently to individual sensor locations, including compartment doors, cab doors, extendible lights, etc. The notification is audible, but includes a visual diagram specifying exactly which sensor has been activated. This allows the driver to ignore warnings coming from known bad sensors or go directly to the sensor activated and take corrective actions. This significantly reduces response times when warnings are activated.

The FLIR camera is mounted on the cab roof above the driver seat for optimal operator sight alignment. Individual flip up monitors for the FLIR camera system are provided directly in front of the driver and turret operator seats. This provides each position with direct visibility from the FLIR, which is especially beneficial during low visibility operations when the screens combined with windshield visibility are needed for safe navigation of the vehicle.

Rosenbauer MADAS system does everything specified, but also provides GPS locationing. This provides a history of the vehicle route at specific times when combined with the included Connected Fleet system. This is extremely useful during vehicle accident investigations as well as during aircraft incidents where vehicle positioning and movement history may be critical.

The importance of water and foam tank mounting in a manner not to transfer the torsional strains of off-road driving from the chassis to the tank should be noted. Rosenbauer attaches the agent tank module to the chassis using rubber-steel elements and stress isolating rubber cone bearings. This type of mounting system provides greater flexibility with loads going across uneven terrain. This is extremely important for adsorbing tortional loads being transmitted. Adsorbing tortional loads reduces stress on the chassis frame rails and on water/foam tank weld locations, which enhances longevity of the vehicle life cycle and reduces repairs.

The pump suction and tank fill are being provided with a 5" Storz adapter, but can be changed to a 4" Storz adapter if that is the appropriate size to match the department's hose couplings. These adapters are not part of the base specifications, but are necessary to attach to each inlet.

The ability to engage the pump at any speed or any RPM is an important requirement that we believe can only truly be met by Rosenbauer. Significant damage can be done to the vehicle, if it is engaged at speeds above manufacturer recommendations.

Pump suction capabilities can be important for certain applications, so we want to add that Rosenbauer provides a special primer designed to identify low suction. The primer automatically engages to ensure adequate suction, which is especially important in a drafting situation when discharging at high volumes associated with ARFF vehicles.

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The FixMix 2.0E electronic foam proportioning system has the ability to select between 1%, 3% and 6% solution with the push of a button and will be preset at 3% for immediate application. When combined with the Panther external foam suction capability, this feature allows various types of foams to be used for different types of fires. This provides immediate foam versatility without contamination of the foam concentrate carried on the vehicle. This capability is unique to the Rosenbauer Panther. This system has the ability to perform input-based foam testing as outlined in NFPA 412 and approved by the FAA. Additionally, this system shows the total amount of foam or water flowed during a discharge cycle, allowing the operator to determine how much foam concentrate or water was used at any incident.

Another great feature only available on the Panther is the ability for the operator to be able to visually determine if water or foam will be flowed. The Panther turret joysticks have LED lights to let the operator know if they are in high flow (4 lights) or low flow (2 lights) and if they will discharge water (blue) or foam (amber). The LCS Screen on the center console also provides the type of agent that will be flowed, along with every discharge and piping valve positions, including which piping has water (blue), foam concentrate (amber) or finished foam (green). These multiple displays provide redundant visual confirmation to the operator, so they can be confident what will be discharged before ever squeezing the trigger.

The HVLA bumper turret is fully controlled by a single joystick. Other manufacturer HVLA style turrets may require two joysticks to operate. A two-joystick operation would significantly impact pump and roll capabilities since the driver could not steer the vehicle while using both hands to operate the turret. The Panther bumper turret also has a record and playback function. This allows the operator to track a movement and then have the turret repeat that movement on its own to provide a true hands free operation.

Proper vehicle operations is important. Rosenbauer encourages any customer to record our vehicle familiarization training sessions to use as recurrent training or future new hire training. An electronic copy of the PowerPoint training presentation and familiarization guides provided to every training attendee will also be provided. Maintenance personnel are encouraged to attend the training sessions as well, since vehicle inspection practices will also be reviewed.

The radio and headset equipment are outlined in the vehicle specifications but priced separately on the bid proposal pricing page, as directed.

**Rosenbauer hopes these detailed clarifications, combined with the detailed specifications, will assist Emmet County in the selection process for the manufacturer that meets the needs of your organization. Best of luck with your ARFF unit purchasing process!**

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# ***Warranty Information***

## ***US EPA/CARB Type-approved Engines***

### ***Industrial and Power Generation Power Systems Parts and Accessories***

- Includes:***
- ***Power Systems Warranty Statement***
  - ***Parts and Accessories Warranty Statement***
  - ***Registration Update Form***

**VOLVO  
PENTA®**



## **QUALITY – SAFETY – ENVIRONMENTAL CARE**

*Quality. Safety. Environmental Care.* These are Volvo Penta's core values and our commitment to you, the Volvo Penta owner. From engineering design and manufacturing to support activities in Parts, Service, and Sales, we have set ourselves high standards to ensure your satisfaction with your Volvo Penta product.

The coverage detailed in this Warranty Booklet demonstrates the confidence and quality commitment we have in our product. Take the time to review your responsibilities as an owner, as well as Volvo Penta's obligations and responsibilities under the terms of your limited warranty. Your Operator's Manual fully explains the operation and required maintenance of your Volvo Penta power package; it should be reviewed by you and others who operate this equipment.

### ***Volvo Penta on the Web***

Volvo Penta is located on the world-wide web at [www.volvopenta.com](http://www.volvopenta.com)

### ***Dealer Locator Number***

For the name of your nearest authorized Volvo Penta Dealer consult your yellow pages, call toll free 1-800-522-1959 (USA only), or visit [www.volvopenta.com](http://www.volvopenta.com).

### ***Warranty Coverage***

Your Volvo Penta warranty coverage starts on the day you take possession of your new Power System regardless of how or when you use your Power System. On the day your new Power System is delivered, the Volvo Penta dealer should register the product using Volvo Penta's online Product Center. To enable you to assert your rights in connection with this warranty, our dealers will check warranty validity in the Product Center. For your convenience, the dealer can supply a printed copy of the warranty registration for safekeeping in the CD folder which contains additional warranty information. If your Power System is not warranty registered at the time of delivery by your selling dealer, you will be asked to present written proof of ownership and/or delivery date to obtain warranty coverage. For warranty coverage of repair parts or accessories, a copy of the relevant invoice or receipt is valid as proof of the in-service date. Contact your Volvo Penta dealer if you have not received an Operator's Manual or if you are uncertain whether product registration has been carried out.

### ***Transfer of Ownership***

The Volvo Penta Limited Warranty is transferable to subsequent engine owners at no charge. If there is a change of ownership or address, complete the Product Registration Update Form located in the back of this booklet and mail to Volvo Penta.

### ***If You Have a Problem***

Your satisfaction with our products and dealer services is important. Volvo Penta takes pride in producing durable, reliable products, and our efforts are supported by a strong dealer network. If you have questions about service or your Product's performance, your Volvo Penta dealer will be happy to answer them. There may be times though, that in spite of the best intentions, differences develop between a Product's owner and a dealer. If this happens to you, Volvo Penta and your dealer will work together to pursue a reasonable resolution.

### ***Extended Protection***

Extended protection coverage may be available for your Industrial product. Contact your Volvo Penta dealer for more information and ask about *IXC*.

***If you experience a problem with your Volvo Penta product:***

Maintain a written record of events (the problem, related conversations/with whom, important dates, etc.), as well as any supporting documents (invoices, work orders, etc.). Then, take the following steps:

1. Discuss the matter with the appropriate department manager at the dealership (e.g., Service Manager, Parts Manager, etc.). Explain exactly what caused the problem and ask what action will be taken.

***If the matter remains unresolved after a reasonable amount of time:***

2. Discuss the matter with the Dealer Principal (usually the owner or co-owner of the dealership). Explain what occurred in step 1.

***If the matter is not resolved within a reasonable amount of time:***

3. Contact Volvo Penta Consumer Relations at:

Volvo Penta of the Americas, LLC  
1300 Volvo Penta Drive  
Chesapeake, VA 23320  
(866) 273-2539  
(757) 436-5150 FAX

Volvo Penta Canada  
7972 Enterprise Street  
Burnaby, BC V5A 1V7  
(604) 872-7511  
(604) 872-4606 FAX

Please be prepared to provide the following information:

- Your name, address, and daytime telephone number.
- The Volvo Penta product model and serial number for each Volvo Penta component in the power package. Check your operator's manual for the serial number plate location.
- Date of purchase.
- Current engine operating hours.
- Selling and/or Servicing Dealer's name.
- Description of the problem.
- Your service and maintenance records



Volvo Penta of the Americas, LLC

1300 Volvo Penta Drive  
Chesapeake, VA 23320

## **POWER SYSTEMS ENGINE LIMITED WARRANTY (Includes Industrial and Power Generation)**

### ***What is Warranted***

**Variable Speed (VE) Off-Road and Stationary Use** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twenty-four (24) months or 3,000 hours, whichever occurs first (with the first twelve (12) months at unlimited running hours). In addition to the base engine warranty, the following base engine components are warranted for an additional twelve (12) months or a total of 12,000 operating hours, whichever occurs first: cylinder block, crankshaft, intake manifold, exhaust manifold, fresh water pump housing, flywheel, flywheel housing, front transmission cover, oil pan, and connection rod forging. During the second year of the warranty period, warrantable parts that are progressively damaged by non-covered parts are not covered by this warranty.

**Prime Power Use (GE Gen Set Prime Power)** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twelve (12) months with no hour limitation. In addition to the base engine warranty, the following base engine components are warranted for an additional twelve (12) months or a total of 12,000 operating hours, whichever occurs first: cylinder block, crankshaft, intake manifold, exhaust manifold, fresh water pump housing, flywheel, flywheel housing, front transmission cover, oil pan, and connection rod forging. During the second year of the warranty period, warrantable parts that are progressively damaged by non covered parts are not covered by this warranty.

**Stand-by Use** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twenty-four (24) months or a total of 1,000 operating hours, whichever occurs first. In addition to the base engine warranty, the following base engine components are warranted for an additional twenty-four (24) months or a total of 3,000 hours, whichever occurs first: cylinder block, crankshaft, intake manifold, exhaust manifold, fresh water pump housing, flywheel, flywheel housing, front transmission cover, oil pan, and connection rod forging. During the third and fourth years of the warranty period, warrantable parts that are progressively damaged by non covered parts are not covered by this warranty.

**Fire Pump Use** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twenty-four (24) months or a total of 1,000 operating hours, whichever occurs first.

Warranty travel time coverage is limited to 500 miles and 10 hours per repair from the nearest servicing Volvo Penta Power Systems Distributor or Dealer.

The warranty commences on the date of delivery to the first retail purchaser, from the date put into service as a dealer demonstrator, the date first placed in rental service, or on the first day of the 25<sup>th</sup> month from the date of shipment from Volvo Penta, whichever occurs first, and applies only to warranted defects first arising and reported to Volvo Penta or one of its authorized service dealers during the applicable warranty period. During the warranty period, the warranty is transferable to subsequent owners. Volvo Penta products are eligible for this warranty coverage only if registered with Volvo Penta. Submission of the warranty registration in Volvo Penta's Product Center or other suitable, dated, proof of purchase is required for registration and to obtain warranty coverage. A copy of the registration from the Product Center can be printed out by a Volvo Penta dealer.

Any part of the Volvo Penta engine that is covered by this warranty and that is found in the reasonable judgment of Volvo Penta to be defective in materials or workmanship will be repaired or replaced at Volvo Penta's option. If a problem occurs, the owner must contact an authorized Volvo Penta Power Systems Distributor or Dealer as soon as possible. All repairs (except for those listed under *What is Not Covered by the Warranty*) will be made by the authorized Volvo Penta Power Systems Distributor or Dealer at no charge during the warranty period. Repairs will be made within a reasonable period of time during the dealer's normal business hours. Parts replacement will be made using genuine new or remanufactured Volvo Penta parts. Volvo Penta's responsibility in respect to warranty claims is limited to making the required repairs or replacements. Parts used in repairs under this warranty will assume the identity of the warranted part being replaced and are entitled to the remaining coverage hereunder.

### ***LIMITATION AND DISCLAIMER OF IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS***

#### **TO THE EXTENT PERMITTED BY APPLICABLE LAWS:**

- 1. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF MERCHANTABILITY AS TO ANY PRODUCT OR PART, WHETHER OR NOT THAT PRODUCT OR PART IS COVERED BY ANY EXPRESS WARRANTY CONTAINED HEREIN;**
- 2. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF;**
- 3. IN THOSE JURISDICTIONS WHERE IMPLIED WARRANTIES MAY NOT BE DISCLAIMED, ANY IMPLIED WARRANTY IS LIMITED IN DURATION TO THE DURATION OF THE EXPRESS WARRANTIES DESCRIBED IN THIS WARRANTY STATEMENT. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.**
- 4. THE REPAIR OR REPLACEMENT OF PARTS OR THE PERFORMANCE OF SERVICE UNDER THIS WARRANTY DOES NOT EXTEND THE LIFE OF THIS WARRANTY BEYOND ITS ORIGINAL EXPIRATION DATE.**

### ***What is Not Covered by the Warranty***

- This warranty does not cover Bosch fuel injection equipment or Bosch electrical components. These items are warranted separately by the Robert Bosch Corp.
- This warranty does not cover any Volvo Penta product that has been subject to misuse, neglect, accident or that has been improperly installed, operated, or maintained.
- This warranty does not cover Volvo Penta product sold or transferred as part of an AS IS transaction without warranties.
- This warranty does not apply to any damage that is the result of rust, corrosion, or prolonged or improper storage.
- This warranty does not cover any Volvo Penta product that has been altered or modified so as to adversely affect its operation, performance or durability or that has been altered or modified to change its intended use.
- This warranty does not extend to repairs made necessary by normal wear and tear, or by the use of parts, accessories, lubricants, or fuels which, in the reasonable judgment of Volvo Penta, are either incompatible with the Volvo Penta product or adversely affect its operation, performance, or durability.
- This warranty does not cover travel or transportation exceeding 500 miles and 10 hours travel time per repair from the nearest servicing Volvo Penta Power Systems Distributor or Dealer.
- This warranty does not cover charges for fuel or lubricant usage, rental costs of any type, removal from or reinstallation of the product, or excessive time necessary to gain service access.
- This warranty does not cover other incidental or consequential expenses including loss of use of the engine, loss of income, or inconvenience.
- Covered parts that are damaged from non-covered parts are not covered by this warranty.
- This warranty does not cover pre-delivery inspection labor and any parts expense.
- This warranty does not cover first service inspection labor and any parts expense.

### ***Owner's Responsibility***

As the Volvo Penta Power System owner, you are responsible for the performance of the required maintenance listed in your operator's manual. Volvo Penta recommends that you retain all receipts covering maintenance on your engine. This record of proper maintenance may be required to determine warranty coverage on certain repairs and should be transferred to each subsequent owner. While Volvo Penta cannot deny warranty coverage solely for the lack of receipts or your failure to ensure the performance of all scheduled maintenance, Volvo Penta may deny coverage if your Volvo Penta engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your Volvo Penta product to a Volvo Penta authorized distributor or dealer as soon as a problem exists and use all reasonable means to protect the product from further damage. The warranty repairs will be completed in a reasonable amount of time.

If you have any questions regarding your warranty rights and responsibilities, you should contact Volvo Penta Consumer Relations, Volvo Penta of the America's, 1300 Volvo Penta Drive, Chesapeake, VA 23320. Our telephone number is 1-866-273-2539.

### ***Other Information***

This warranty is only valid for products type-approved for conformity with US EPA or California ARB regulations. The warranty (if any) for Products without US EPA or California ARB type-approvals operated outside these areas is described in the AB Volvo International Warranty statement. Copies of the International Warranty Statement are available from Volvo Penta Consumer Relations.

Note: Outside the U.S. and Canada, there may be additional charges based on local practices and conditions. These charges may include, but are not limited to; freight, insurance, taxes, import duties, and/or other financial charges, including those levied by local governments and their respective agencies. These charges are not covered by the Volvo Penta Limited Warranty and are the responsibility of the retail purchaser.

Volvo Penta reserves the right to change or improve the design of any Volvo Penta product without assuming any obligation to modify any Volvo Penta product previously manufactured.

***In certain areas, this product may also be covered by an emissions system warranty. Please refer to the emissions system warranty statement supplement. Copies may be obtained from Volvo Penta Consumer Relations at the address on page two of this document.***

### ***REMEDIES AND EXCLUSION OF CERTAIN DAMAGES***

Any part of the Volvo Penta engine or power system that is covered by this warranty and that is found in the reasonable judgment of Volvo Penta to be defective in materials or workmanship will be repaired or replaced at Volvo Penta's option. If a problem occurs, the owner must bring the product to an authorized Volvo Penta Service Dealer in a timely manner. All repairs (except for those listed under *What is Not Covered by the Warranty*) will be made by an authorized Volvo Penta Service Dealer at no charge during the warranty period. Repairs will be made within a reasonable period of time during the dealer's normal business hours. Parts replacement will be made using genuine new or remanufactured Volvo Penta parts. Volvo Penta's responsibility with respect to warranty claims is limited to making the required repairs or replacements. All parts will be shipped via standard ground methods. Engines or parts provided under this warranty assume the identity of the engine or part being replaced, and are entitled to the remaining warranty coverage only.

**THE REPAIR AND REPLACEMENT REMEDIES DESCRIBED IN THIS WARRANTY STATEMENT ARE THE OWNER'S SOLE AND EXCLUSIVE REMEDY. IN NO EVENT SHALL VOLVO PENTA BE LIABLE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

**THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY. THE TERMS, LIMITATIONS AND DISCLAIMERS CONTAINED IN THIS LIMITED WARRANTY, AS WELL AS THOSE DOCUMENTS PREPARED IN CONJUNCTION WITH THE SALE OF VOLVO PENTA PRODUCTS, MAY NOT BE MODIFIED, ALTERED, OR WAIVED BY ANY ACTION, INACTION OR REPRESENTATIONS, WHETHER ORAL OR IN WRITING, EXCEPT UPON THE EXPRESSED, WRITTEN AUTHORITY OF A MANAGEMENT LEVEL EMPLOYEE OF VOLVO PENTA.**



Volvo Penta of the Americas, LLC

1300 Volvo Penta Drive  
Chesapeake, VA 23320  
757.436.5100

## REPLACEMENT PARTS AND ACCESSORIES LIMITED WARRANTY

### *What is Warranted*

Volvo Penta of the Americas, LLC warrants that all new or factory remanufactured parts and accessories sold and installed by an authorized Volvo Penta Dealer or Distributor will be free from defects in material or workmanship for a period of two (2) years from the date of sale with the following hour limitations: Industrial products, prime power and VE 3,000 hours, Industrial Products "Stand-by" and fire pump 1,000 hours.

Volvo Penta of the Americas, LLC warrants that all new or factory remanufactured parts and accessories sold by, but not installed by, a Volvo Penta Dealer or Distributor will be free from defects in material or workmanship for a period of one (1) year from the date of sale.

Volvo Penta of the Americas, LLC warrants that all new parts and accessories sold and installed by an authorized Volvo Penta Dealer, Distributor, or Original Equipment Manufacturer (OEM) as part of an engine package, and installed prior to hand-over to the end-customer, will be free from defects in material or workmanship for a period of two (2) years from the date of commissioning (delivery) of the Product and will carry the same hour limitations as the applicable new-product warranty.

The warranty commences on the date the part or accessory is first sold or installed by an authorized Volvo Penta Dealer or Distributor, or if installed in new equipment by an Original Equipment Manufacturer, the date of first retail purchase or from the date put into service as a demonstrator and applies only to warranted defects first arising and reported to Volvo Penta or one of its authorized service centers during the applicable warranty period. During the warranty period, the warranty is transferable to subsequent owners. Suitable dated proof of purchase such as a retail receipt or work order is required to obtain warranty coverage.

Parts used in repairs under this warranty will assume the identity of the warranted part being replaced and are entitled to the remaining coverage hereunder.

### ***LIMITATION AND DISCLAIMER OF IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS***

#### **TO THE EXTENT PERMITTED BY APPLICABLE LAWS:**

- 1. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF MERCHANTABILITY AS TO ANY PRODUCT OR PART, WHETHER OR NOT THAT PRODUCT OR PART IS COVERED BY ANY EXPRESS WARRANTY CONTAINED HEREIN;**
- 2. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF;**
- 3. IN THOSE JURISDICTIONS WHERE IMPLIED WARRANTIES MAY NOT BE DISCLAIMED, ANY IMPLIED WARRANTY IS LIMITED IN DURATION TO THE DURATION OF THE EXPRESS WARRANTIES DESCRIBED IN THIS WARRANTY STATEMENT. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.**
- 4. THE REPAIR OR REPLACEMENT OF PARTS OR THE PERFORMANCE OF SERVICE UNDER THIS WARRANTY DOES NOT EXTEND THE LIFE OF THIS WARRANTY BEYOND ITS ORIGINAL EXPIRATION DATE.**

### ***What is Not Covered by the Warranty***

- Volvo Penta parts that were sold as part of an engine or power systems package.
- any Volvo Penta product that has been subject to misuse, neglect, accident, or that has been improperly installed, operated, or maintained. This warranty does not apply to any damage that is the result of rust or corrosion.
- any Volvo Penta product that has been used for racing or in the preparation for racing; has been altered or modified so as to adversely affect its operation, performance or durability; or that has been altered or modified to change its intended use.
- any Volvo Penta product sold or transferred in an AS IS transaction without warranties.
- costs to modify fuel systems or other components needed to meet local altitude requirements.
- repairs made necessary by normal wear and tear, or by the use of parts, accessories, lubricants, or fuels which, in the reasonable judgment of Volvo Penta, are either incompatible with the Volvo Penta product or adversely affect its operation, performance, or durability.
- travel to or from the product or transportation of the product to and from the servicing dealer or distributor; charges for towing, storage, fuel or lubricant usage, premium (air or overnight) freight charges; rental costs of any type; and excessive time necessary to gain service access, or any other incidental or consequential expenses including loss of use of the engine or drive train, loss of income, or inconvenience.

- labor charges for removal or reinstallation of the failed part or accessory unless the part or accessory was originally installed by an authorized Volvo Penta Dealer, Distributor or Original Equipment Manufacturer.
- Covered parts that are damaged by non-covered parts.

### ***Owner's Responsibility***

The operation, maintenance, and care of the Volvo Penta part or accessory must follow the same guidelines established for the engine and power systems package as outlined in the Operator's Manual and are the owner's responsibility. You shall use all reasonable means to protect the Product from further damage. The owner must keep records of all maintenance services performed. This record of proper maintenance and service may be required to determine warranty coverage on certain repairs and should be transferred to each subsequent owner. If you are not sure of the proper maintenance procedures, contact the Volvo Penta Service Department.

If you have any questions regarding your warranty rights and responsibilities, you should contact Volvo Penta at Volvo Penta of the America's, 1300 Volvo Penta Drive, Chesapeake, VA 23320. Our telephone number is 1-866-273-2539.

### ***Other Information***

This warranty is only valid for products type-approved for conformity with US EPA or California ARB regulations. The warranty (if any) for parts and accessories without US EPA or California ARB type-approvals is described in the AB Volvo International Warranty statement. Copies of the International Warranty Statement are available from Volvo Penta.

**Note:** Outside the U.S. and Canada, there may be additional charges based on local practices and conditions. These charges may include, but are not limited to, freight, insurance, taxes, import duties, and or other financial charges including those levied by local governments and their respective agencies. These charges are not covered by the Volvo Penta Warranty and are the responsibility of the retail purchaser.

Volvo Penta reserves the right to change or improve the design of any Volvo Penta product without assuming any obligation to modify any Volvo Penta product previously manufactured.

To obtain copies of this warranty, please contact Volvo Penta of the Americas, Inc. at the address listed above.

### ***REMEDIES AND EXCLUSION OF CERTAIN DAMAGES***

Any Volvo Penta part or accessory that is covered by this warranty and that is found in the reasonable judgment of Volvo Penta to be defective in materials or workmanship will be repaired or replaced at Volvo Penta's option. If a problem occurs, the owner must bring the part or accessory to an authorized Volvo Penta Dealer or Distributor as soon as possible. All repairs (except for those listed under *What is Not Covered by the Warranty*) will be made by an authorized Volvo Penta Dealer or Distributor at no charge during the warranty period. Repairs will be made within a reasonable period of time during the dealer or distributor's normal business hours. Parts replacement will be made using genuine new or remanufactured Volvo Penta parts. Volvo Penta's responsibility with respect to warranty claims is limited to making the required repairs or replacements. All parts will be shipped via standard ground methods. Labor to remove and replace the part or accessory will only be covered if the part or accessory was originally installed by an Authorized Volvo Penta Dealer, Distributor or Original Equipment Manufacturer.

**THE REPAIR AND REPLACEMENT REMEDIES DESCRIBED IN THIS WARRANTY STATEMENT ARE THE OWNER'S SOLE AND EXCLUSIVE REMEDY. IN NO EVENT SHALL VOLVO PENTA BE LIABLE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

**THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY. THE TERMS, LIMITATIONS AND DISCLAIMERS CONTAINED IN THIS LIMITED WARRANTY, AS WELL AS THOSE DOCUMENTS PREPARED IN CONJUNCTION WITH THE SALE OF VOLVO PENTA PRODUCTS, MAY NOT BE MODIFIED, ALTERED, OR WAIVED BY ANY ACTION, INACTION OR REPRESENTATIONS, WHETHER ORAL OR IN WRITING, EXCEPT UPON THE EXPRESSED, WRITTEN AUTHORITY OF A MANAGEMENT LEVEL EMPLOYEE OF VOLVO PENTA.**

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**Volvo Penta of the Americas, LLC**

1300 Volvo Penta Drive

Chesapeake, VA 23320

Ph: 757-436-2800

Fax: 757-436-5152

Email: vpa.warrantyadministration@volvo.com

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## PRODUCT REGISTRATION UPDATE FORM

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This form is to be used to update owner information with Volvo Penta of the Americas in the event of a change of address or transfer of ownership. Mail, fax, or e-mail to the above address.

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*Product Information:*

Engine serial number(s) \_\_\_\_\_

Other components serial number(s) \_\_\_\_\_

*Request type:*

☐ Change of address      ☐ Change of ownership

---

*New owner and / or new address information (proof of ownership required):*

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

---

*For transfer of ownership only:*

Original owner (if known) \_\_\_\_\_

Reselling dealer (if any) \_\_\_\_\_ Transfer date \_\_\_\_\_

---

*Contact in the event additional information is needed (proof of ownership required):*

Contact Name \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_ E-Mail \_\_\_\_\_







**Volvo Penta of the Americas, LLC**  
1300 Volvo Penta Drive  
Chesapeake, VA 23320



## **Panther 4x4**

### **Aircraft Rescue and Firefighting (ARFF) Vehicle**

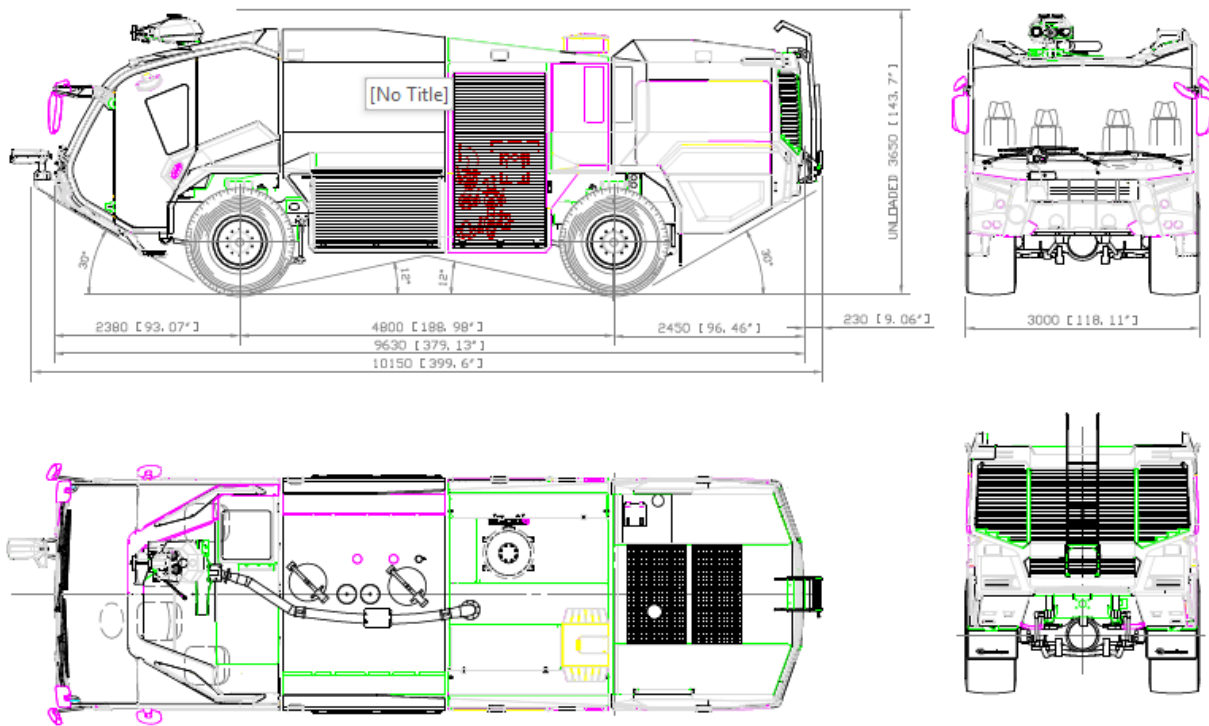


#### **Chassis & Cab**

- Tubular chassis frame rails
- Volvo 700 HP D6 Industrial engine
- Twin Disc 6 speed electronic transmission
- High performance coil spring suspension (HPCS)
- Differential locks for front and rear axles
- Top speed approx. 70 mph (fully loaded)
- Acceleration 0-50 mph/25 sec (fully loaded)
- On board battery charger
- Monitoring and Data Acquisition System (MADAS)
- 105 cubic ft of windshield visibility
- Seating for up to 6 personnel
- Flip up center console
- Flip up dashboard camera monitors

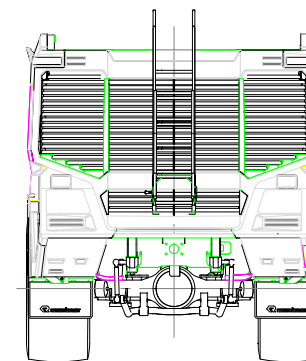
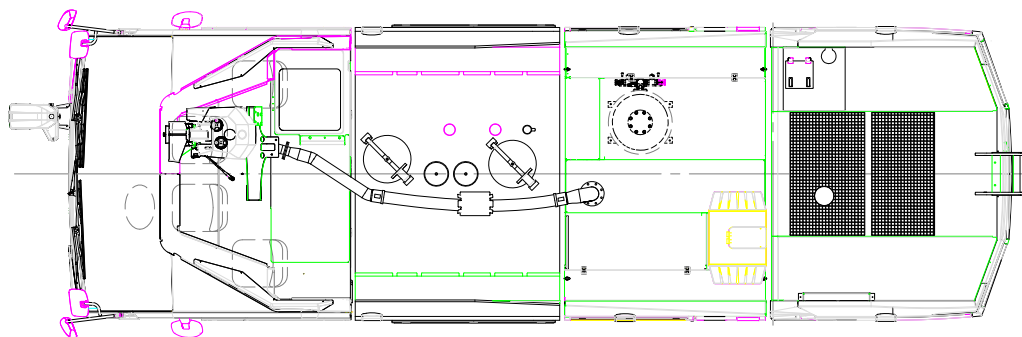
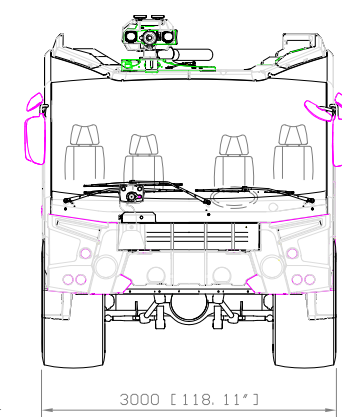
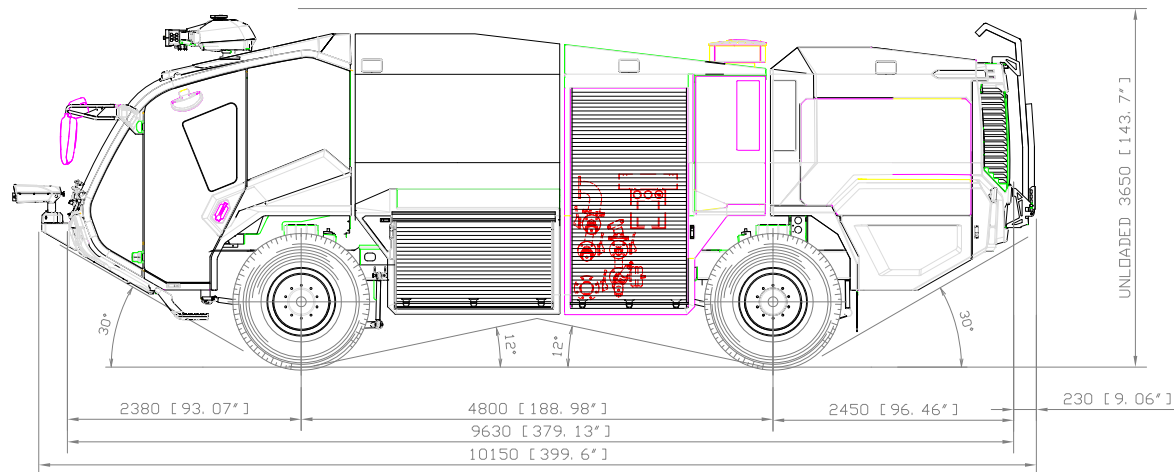
#### **Body & Firefighting System**

- 1585 gallon water tank
- 200 gallon foam tank
- Rosenbauer N80 2100 GPM pump
- Rosenbauer RM35 turrets including hydrochem
- Single or twin agent booster reel
- Two (2) 1 3/4" pre-connect handlines
- Windshield deluge system
- 500 lb. Dry Chemical or Halotron systems
- LED integrated warning lights
- Full firefighting structural panel
- Automatic foam selection of 1% thru 9%
- Weight of 60,000 lbs (full agent and equipment)
- Onboard generator systems



## Some Available Options

- High Volume Low Attack (HVLA) bumper turret
- Compressed Air Foam System (CAFS)
- High pressure water pump
- Bronze pump
- Internal foam testing system
- Under truck nozzles
- Swing out agent hose reels
- Driver Enhanced Vision Systems (EMEREC)
- Forward Looking Infra Red (FLIR) camera
- Multiple winterization systems
- Remote engine start
- Central lubrication system
- Disc brakes
- Door arrester system
- Electric and tinted windows
- Cupholders and dash mounted fans
- Various slide out shelves and trays
- Hydraulic generator 6KW to 15KW
- Command light tower
- Safe to approach lights
- Airfield driving lights
- Exterior water and foam lights
- Multiple scene lighting configurations
- 360 degree camera system
- Color camera and recording system
- Electric 200' cord reel
- Auxiliary air compressor
- Pneumatic 200' hose reel
- Tire pressure monitoring system
- Tire bead locks
- Cab storage cabinets
- Roof top ladder gantry
- Rear ladder mounting system
- Simulator systems



CHASSIS 58863 GVWR 4x4

CREW up to 1 + 5

TANK CAPACITY WATER up to 1500 GAL.

TANK CAPACITY FOAM up to 200 GAL.

PUMP UNIT N80 + FIXMIX 2.0

MONITOR RM 35  
+RM 15

DRY CHEMICAL UNIT 500 LB.

TIRES 24.00 R 21

ROSENBAUER MN  
5181 260TH ST.  
WYOMING, MN 55092

**Rosenbauer**

DIESE ZEICHNUNG KANN ZUSÄTZLICHE AUSSTATTUNGEN ENTHALTEN, DIE NICHT IM PREIS INBEGRIFFEN SIND.

THIS DRAWING MAY SHOW OPTIONAL ACCESSORIES WHICH ARE NOT INCLUDED IN THE PRICE.

FAHRZEUG BELASTET GEZEICHNET. ALLE BELASTUNGSABHÄNGIGE MASSE KÖNNEN AUFGRUND DER TOLERANZEN DER FAHRZEUGGESTELLHERSTELLER UM 440 kg ABWEICHEN.

VEHICLE IS SHOWN LOADED. DUE TO THE CHASSIS MANUFACTURER'S TOLERANCES, ALL LOAD-DEPENDENT MEASUREMENTS MAY VARY BY 440.

DIE MIT DIESEM DOKUMENT WEITERGEGEBENEN INFORMATIONEN, DATEN UND KENNTHESSE SÖRFEN VOM EMPFÄNGER NUR IM ZUSAMMENHANG MIT DEM FÜR DIE ZEICHNUNGSGESTELLUNG AUSGELENDEN GEMEINSAMEN PROJEKT MIT ROSENBAUER VERWENDET WERDEN. NACH DESSEN BEENDIGUNG VERPFLICHTET SICH DER EMPFÄNGER DIESE KEINER FÜR EIGENE NOCH FÜR FREIHE ZWECKE ZU BENUTZEN. FÜR KEINERLEI WECHSELUNG DER INFORMATIONEN DURCH ROSENBAUER IST AUSDRÜCKLICH UNTERSAGT. ALS DER KENNHEIT DER WECHSELUNG ÜBERGEBENEN INFORMATIONEN UND DES KENNHEIT SÖRFEN VOM EMPFÄNGER IM HINBLICK AUF SCHUTZRECHTSMÄßIGEN KEINE RECHTE. INSBESONDERE KEINE RECHTE AUF VORBENÜTZUNG GELTEND GEMACHT WERDEN. VTR WÄHREN UNKERE RECHTE!

THE RECIPIENT MAY ONLY USE THE INFORMATION, DATA AND KNOW-HOW PROVIDED IN THIS DOCUMENT IN CONNECTION WITH THE JOINT PROJECT WITH ROSENBAUER FOR WHICH THIS DRAWING WAS CREATED. THE RECIPIENT UNDERTAKES NOT TO USE THE PROVIDED INFORMATION FOR ITS OWN PURPOSES OR FOR THIRD PARTIES. THE DISCLOSURE OF INFORMATION WITHOUT ROSENBAUER'S PRIOR WRITTEN CONSENT IS PROHIBITED. IN VIEW OF INTELLECTUAL PROPERTY THE RECIPIENT MAY NOT DERIVE ANY RIGHTS, IN PARTICULAR NO PRIOR USE RIGHTS. ALL RIGHTS RESERVED!

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F		ÄNDERUNGEN VORBEHALTEN		DRAWING NOT BINDING	
e		MASSSTAB/SCALE		1:1 1:10 1:100 1:1000 1:2000	
d		BEZ. 1/TITLE 1		PROPOSED -	
c		BEZ. 2/TITLE 2		PANTHER 4x4 NEW	
b		DATUM/DATE		ZUSÄTZLICHE NR./DRAWING NO.	
a		ÄNDERUNG/REVISION		P6432-01	
DATUM/DATE		NAME		BLATT/SHEET	
12/05/16		JPD		1/1	
12/05/16		JPD			



## FIRE APPARATUS WARRANTY

ROSENBAUER MINNESOTA, LLC, warrants each new ARFF fire apparatus manufactured by ROSENBAUER MINNESOTA, LLC for a period of ONE YEAR from the date of delivery.

Under this warranty we agree to furnish any parts to replace those that have failed due to defective material or workmanship where there is no indication of abuse, neglect, unusual or other than normal service providing that such parts are, at the option of ROSENBAUER MINNESOTA, LLC made available for our inspection at our request, returned to our factory or other location designated by us with transportation prepaid within thirty days after the date of failure or within one year from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to defective material or workmanship.

All warranty work performed must be completed at the ROSENBAUER MINNESOTA, LLC or a ROSENBAUER MINNESOTA, LLC approved service center. The expense of any transportation to or from the factory or approved service center shall be borne by the purchaser and is not an item covered under this warranty.

The warranty on the engine and other chassis supplied components, water tank, generator, electrical components and other devices not manufactured by ROSENBAUER MINNESOTA, LLC is limited to the warranty and warranty terms of the manufacturer thereof.

This warranty shall not apply to any fire apparatus which has been repaired or altered outside our factory in any way, which in our opinion might affect its stability or reliability.

This warranty shall not apply to those items which are usually considered normal maintenance and upkeep services, including, but not limited to, electrical lamps, valve seals, normal lubrication and/or proper adjustment of minor items.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability in connection with the sales of our apparatus unless made in writing by ROSENBAUER MINNESOTA, LLC.

NOTE: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

### Rosenbauer South Dakota, LLC

100 Third Street  
Lyons, SD 57041

Phone: (605) 543-5591  
Fax: (605) 543-9701

### Rosenbauer Minnesota, LLC

P.O. Box 549  
5181 260th Street  
Wyoming, Minnesota  
55092

Phone: (651) 462-1000  
Fax: (651) 462-1700



## ROSENBAUER PUMP WARRANTY

ROSENBAUER MINNESOTA, LLC warrants, to the original buyer only, that products and parts manufactured by ROSENBAUER MINNESOTA, LLC 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 years from the date of shipment by ROSENBAUER MINNESOTA, LLC, whichever period will be the first to expire; provided the buyer notifies ROSENBAUER MINNESOTA, LLC in writing, of the defect in said product within the warranty period, and said product is found by ROSENBAUER MINNESOTA, LLC to be conforming with the aforesaid warranty.

When required in writing by ROSENBAUER MINNESOTA, LLC, defective products must be promptly returned by the buyer to the ROSENBAUER MINNESOTA plant or at such other place as may be specified by ROSENBAUER MINNESOTA with transportation and other charges prepaid. An RGA is required for all products and parts and may be requested by phone, fax or mail. The aforesaid warranty excludes any responsibility or liability of ROSENBAUER MINNESOTA for:

(a) damages or defects due to accident, abuse, misuse, abnormal operating conditions, negligence, accidental causes or improper maintenance, or attributable to written specifications or instructions furnished by buyer;

(b) defects in products manufactured by others and furnished by ROSENBAUER MINNESOTA 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, ROSENBAUER MINNESOTA will assign to the buyer, if requested by Buyer;

(c) any product or part, altered, modified, serviced or repaired other than by ROSENBAUER MINNESOTA, 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;

(e) normal wear items (packing, strainers, filters, light bulbs, anodes, intake screens, etc)

All other warranties are excluded, whether expressed or implied by operation of law or otherwise, including all implied warranties of merchantability or fitness for purpose. ROSENBAUER MINNESOTA shall not be liable for consequential or incidental damages directly or indirectly arising or resulting from breach of any of the terms of this limited warranty or from the sale, handling, or use of any other product or part. ROSENBAUER MINNESOTA liability hereunder, either for breach of warranty or for negligence, is expressly limited at ROSENBAUER MINNESOTA option:

(A) to the replacement at the agreed point of delivery of any product or part, which upon inspection by ROSENBAUER MINNESOTA or its duly authorized representative, is found not to conform to the limited warranty set forth above, or

(B) to the repair of such product or part, or

(C) to 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 the buyer.

NOTE: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

### Rosenbauer South Dakota, LLC

100 Third Street  
Lyons, SD 57041

Phone: (605) 543-5591  
Fax: (605) 543-9701

### Rosenbauer Minnesota, LLC

P.O. Box 549  
5181 260th Street  
Wyoming, Minnesota  
55092

Phone: (651) 462-1000  
Fax: (651) 462-1700



# Five (5) Year Paint Warranty

## **TERMS AND CONDITIONS**

Rosenbauer hereby warrants the paint on the body of each new fire & rescue vehicle to be free from blistering, peeling, corrosion or any other adhesion defect caused by defective manufacturing methods or paint material selection for a warranty period of five (5) years starting on the date the vehicle is delivered to original purchaser. Under this warranty, Rosenbauer agrees to furnish any item or items to replace those that have been found to be defective in material or workmanship where there is no indication of abuse, neglect or other than normal service. Such an item or items, at the option of Rosenbauer must be made available for our inspection at our request and returned to our factory or another location designated by Rosenbauer. Transportation of such an item or items will be arranged and covered by buyer within thirty (30) days after the date of failure and within five (5) years from the date of delivery of the apparatus to the original purchaser. The inspection must indicate that the failure was attributed to an adhesion defect caused by defective manufacturing methods or paint material selection. Authorization for repair or item replacement must be sought from Rosenbauer customer service department prior to repair or item replacement occurring.

## **THIS WARRANTY SHALL NOT APPLY TO OR COVER THE FOLLOWING:**

- Any item that has been repaired, repainted or altered by a facility not approved in advance by Rosenbauer.
- Special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, lost profits or transportation fees or charges to or from any facility.
- Any defect resulting from misuse, negligence, alteration, accident or lack of normal or required maintenance or adjustments, exposure to corrosive agents, fire, severe environmental conditions or acts of God.
- Painted items which are manufactured by a party other than Rosenbauer and which are separately warranted by that party included cabs not manufactured and painted by Rosenbauer.

## **EXCLUSIONS OF DAMAGES BOTH INCIDENTAL AND CONSEQUENTIAL.**

At no time shall Rosenbauer be held liable for any incidental, consequential, indirect, special and/or punitive damages whatsoever, whether coming from breach of contract, warranty, tort or equity. Such items shall include the chassis or other items sold by Rosenbauer, or their operation or their failure to operate, or defects herein, or any undertakings, acts or omissions related to, regardless whether Rosenbauer's knowledge of the possibility of any such damage.

Without limitation of the generality of the preceding statements, Rosenbauer categorically disclaims any and all liability for property and personal injury, damages, penalties for lost revenue and/or profit, loss of chassis or products and associated pieces of equipment, the expense of substituting chassis and/or products, or the out of service expenses, resulting from damages and/or delays, that creates down time expenses and/or create economic losses, or any third party claims for damages.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability or make any alteration to this warranty in connection with the sale of our apparatus unless expressly given in writing by Rosenbauer.

**NOTE:** Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.



# **Lifetime**

## **Rosenbauer Water / Foam Tank**

### **Service Warranty**

Rosenbauer warrants that these goods manufactured and sold by Rosenbauer will be free from defects in material and workmanship for the service life of the original vehicle (vehicle must be actively used in an emergency re-sponse for fire suppression).

Every Rosenbauer Tank is inspected and tested before leaving our facility. Should your Rosenbauer Tank require service, please notify Rosenbauer via email, fax, in writing or by calling Rosenbauer at 1-877-543-5591. 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, Rosenbauer will cover the cost to repair the 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 Rosenbauer. The warranty will not cover tanks that have been im-properly operated, misused, abused, or modified from its intended or designed use. Serial number must not have been altered, defaced or re-moved.

Should Rosenbauer determine that the service claim is valid under this warranty for a tank located outside of the United States and Canada, Rosenbauer will assume the costs for travel, labor and material for the warranty repair as described above.

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, Rosenbauer 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 Rosenbauer employees or their des-ignee. Rosenbauer will make every reasonable effort to support our products through alternative means.

In no event will Rosenbauer be liable for an amount in excess of the purchase price of the water/foam tank at the time of manufacture or for any loss or damage, 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 Rosenbauer.

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.

**NOTE:** Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.



## **TWIN DISC, INCORPORATED** **EXCLUSIVE LIMITED WARRANTY**

### **TD61-1179 / TD61-1180 / TD61-2619 TRANSMISSION SYSTEM** **FOR AIRPORT RESCUE FIRE FIGHTING VEHICLES**

- A. Twin Disc, Incorporated warrants all assembled products and parts, (except component products or parts on which written warranties issued by the respective manufacturers thereof are furnished to the original customer, as to which Twin Disc, Incorporated makes no warranty and assumes no liability) against defective materials or workmanship *for a period of thirty (30) months from the date of shipment by Twin Disc, Incorporated to original customer, but not to exceed twenty-four (24) months of service, whichever occurs first.* This is the only warranty made by Twin Disc, Incorporated and is in lieu of any and all other warranties, express or implied, including the warranties of merchantability or fitness for a particular purpose and no other warranties are implied or intended to be given by Twin Disc, Incorporated. The original customer does not rely upon any tests or inspections by Twin Disc, Incorporated or on Twin Disc, Incorporated's application engineering.
- B. The exclusive remedy provided by Twin Disc, Incorporated whether arising out of warranty within the applicable warranty period as specified, or otherwise (including tort liability), shall at the sole option of Twin Disc, Incorporated be either the repair or replacement of any Twin Disc, Incorporated part or product found by Twin Disc, Incorporated to be defective and the labor to perform that work and to remove and reinstall (or equivalent credit). In this context, labor is defined as the flat rate labor hours established by Twin Disc, Incorporated in the published Twin Disc Flat Rate Schedule, required to remove, disassemble, inspect, repair, reassemble, reinstall and test the Twin Disc, Incorporated product only. Authorized reasonable travel and living expenses will be considered for payment. Under no circumstances, including a failure of the exclusive remedy, shall Twin Disc, Incorporated be liable for economic loss, consequential, incidental or punitive damages.

The above warranty and remedy are subject to the following terms and conditions:

1. Complete parts or products upon request must be returned transportation prepaid and also the claims submitted to Twin Disc, Incorporated within sixty (60) days after completion of the in warranty repair.
  2. The warranty is void if, in the opinion of Twin Disc, Incorporated, the failure of the part or product resulted from abuse, neglect, improper maintenance or accident.
  3. The warranty is void if any modifications are made to any product or part without the prior written consent of Twin Disc, Incorporated.
  4. The warranty is void unless the product or part is properly transported, stored and cared for from the date of shipment to the date placed in service.
  5. The warranty is void unless the product or part is properly installed and maintained within the rated capacity of the product or part with installations properly engineered and in accordance with the practices, methods and instructions approved or provided by Twin Disc, Incorporated.
  6. The warranty is void unless all required replacement parts or products are of Twin Disc origin or equal, and otherwise identical with components of the original equipment. Replacement parts or products not of Twin Disc origin are not warranted by Twin Disc, Incorporated.
- C. As consideration for this warranty, the original customer and subsequent purchaser agree to indemnify and hold Twin Disc, Incorporated harmless from and against all and any loss, liability, damages or expenses for injury to persons or property, including without limitation, the original customer's and subsequent purchaser's employees and property, due to their acts or omissions or the acts or omissions of their agents, and employees in the installation, transportation, maintenance, use and operation of said equipment.
- D. Only a Twin Disc, Incorporated authorized factory representative shall have authority to assume any cost or expense in the service, repair or replacement of any part or product within the warranty period, except when such cost or expense is authorized in advance in writing by Twin Disc, Incorporated.
- E. Twin Disc, Incorporated reserves the right to improve the product through changes in design or materials without being obligated to incorporate such changes in products of prior manufacture. The original customer and subsequent purchasers will not use any such changes as evidence of insufficiency or inadequacy of prior designs or materials.
- F. If failure occurs within the warranty period, and constitutes a breach of warranty, repair or replacement parts will be furnished on a no charge basis and these parts will be covered by the remainder of the unexpired warranty which remains in effect on the complete unit.

**TWIN DISC, INCORPORATED**  
**FLAT RATE HOUR ALLOWANCE**  
**TD61-1179 / TD61-1180/ TD61-2619 TRANSMISSION SYSTEM FOR**  
**AIRPORT RESCUE FIRE FIGHTING VEHICLE POWER TRAIN INSTALLATION**  
(Hourly Labor Rates Must be Acceptable to Twin Disc, Incorporated)

**Transmission, Torque Converter and Electronic Control**

Hour

**A. Removal and Reinstallation or Reset Labor from Vehicle:**

1. Units, Torque Converter-20 Hrs., Transmission-12 Hrs., Test-4 Hrs .....36

Includes R&R of both units or either unit, all necessary parts and equipment.  
Drain and refill, clean and flush hoses and coolers, disconnect and connect  
hydraulic lines, linkages, and drivelines and test.

**2. External Assemblies**

Pump .....1  
Modulating Valve .....1  
Regulator Valve .....1  
Magnetic Pickup .....1  
Electronic Control .....3  
Wiring Harness (checking).....1  
PTO Clutch Assembly.....1  
Lip Seal.....1

**B. Repair Labor on Units**  
**TRANSMISSION**

1. Unit Overhaul .....30  
(Includes pre-clean, disassemble, clean, inspect, assemble and test.)

**2. Valve Assembly**  
(Disassemble, clean, inspect, assemble and test)

Modulating Valve (replace - do not open or repair).....0  
Regulator .....1

**TORQUE CONVERTER**

1. Unit Overhaul .....14  
(Includes pre-clean, disassemble, clean, inspect, assemble and test.)

**2. Valve Assembly**

Modulating Valve (replace - do not open or repair).....0

3. PTO Clutch Assembly with Valve.....3  
(Disassemble, clean, inspect, assemble and test.)

# ***Warranty Information***

## ***US EPA/CARB Type-approved Engines***

### ***Industrial and Power Generation Power Systems Parts and Accessories***

- Includes:***
- ***Power Systems Warranty Statement***
  - ***Parts and Accessories Warranty Statement***
  - ***Registration Update Form***

**VOLVO  
PENTA®**

## **QUALITY – SAFETY – ENVIRONMENTAL CARE**

*Quality. Safety. Environmental Care.* These are Volvo Penta's core values and our commitment to you, the Volvo Penta owner. From engineering design and manufacturing to support activities in Parts, Service, and Sales, we have set ourselves high standards to ensure your satisfaction with your Volvo Penta product.

The coverage detailed in this Warranty Booklet demonstrates the confidence and quality commitment we have in our product. Take the time to review your responsibilities as an owner, as well as Volvo Penta's obligations and responsibilities under the terms of your limited warranty. Your Operator's Manual fully explains the operation and required maintenance of your Volvo Penta power package; it should be reviewed by you and others who operate this equipment.

### ***Volvo Penta on the Web***

Volvo Penta is located on the world-wide web at [www.volvopenta.com](http://www.volvopenta.com)

### ***Dealer Locator Number***

For the name of your nearest authorized Volvo Penta Dealer consult your yellow pages, call toll free 1-800-522-1959 (USA only), or visit [www.volvopenta.com](http://www.volvopenta.com).

### ***Warranty Coverage***

Your Volvo Penta warranty coverage starts on the day you take possession of your new Power System regardless of how or when you use your Power System. On the day your new Power System is delivered, the Volvo Penta dealer should register the product using Volvo Penta's online Product Center. To enable you to assert your rights in connection with this warranty, our dealers will check warranty validity in the Product Center. For your convenience, the dealer can supply a printed copy of the warranty registration for safekeeping in the CD folder which contains additional warranty information. If your Power System is not warranty registered at the time of delivery by your selling dealer, you will be asked to present written proof of ownership and/or delivery date to obtain warranty coverage. For warranty coverage of repair parts or accessories, a copy of the relevant invoice or receipt is valid as proof of the in-service date. Contact your Volvo Penta dealer if you have not received an Operator's Manual or if you are uncertain whether product registration has been carried out.

### ***Transfer of Ownership***

The Volvo Penta Limited Warranty is transferable to subsequent engine owners at no charge. If there is a change of ownership or address, complete the Product Registration Update Form located in the back of this booklet and mail to Volvo Penta.

### ***If You Have a Problem***

Your satisfaction with our products and dealer services is important. Volvo Penta takes pride in producing durable, reliable products, and our efforts are supported by a strong dealer network. If you have questions about service or your Product's performance, your Volvo Penta dealer will be happy to answer them. There may be times though, that in spite of the best intentions, differences develop between a Product's owner and a dealer. If this happens to you, Volvo Penta and your dealer will work together to pursue a reasonable resolution.

### ***Extended Protection***

Extended protection coverage may be available for your Industrial product. Contact your Volvo Penta dealer for more information and ask about *IXC*.

***If you experience a problem with your Volvo Penta product:***

Maintain a written record of events (the problem, related conversations/with whom, important dates, etc.), as well as any supporting documents (invoices, work orders, etc.). Then, take the following steps:

1. Discuss the matter with the appropriate department manager at the dealership (e.g., Service Manager, Parts Manager, etc.). Explain exactly what caused the problem and ask what action will be taken.

***If the matter remains unresolved after a reasonable amount of time:***

2. Discuss the matter with the Dealer Principal (usually the owner or co-owner of the dealership). Explain what occurred in step 1.

***If the matter is not resolved within a reasonable amount of time:***

3. Contact Volvo Penta Consumer Relations at:

Volvo Penta of the Americas, LLC  
1300 Volvo Penta Drive  
Chesapeake, VA 23320  
(866) 273-2539  
(757) 436-5150 FAX

Volvo Penta Canada  
7972 Enterprise Street  
Burnaby, BC V5A 1V7  
(604) 872-7511  
(604) 872-4606 FAX

Please be prepared to provide the following information:

- Your name, address, and daytime telephone number.
- The Volvo Penta product model and serial number for each Volvo Penta component in the power package. Check your operator's manual for the serial number plate location.
- Date of purchase.
- Current engine operating hours.
- Selling and/or Servicing Dealer's name.
- Description of the problem.
- Your service and maintenance records



Volvo Penta of the Americas, LLC

1300 Volvo Penta Drive  
Chesapeake, VA 23320

**POWER SYSTEMS ENGINE  
LIMITED WARRANTY  
(Includes Industrial and Power Generation)**

***What is Warranted***

**Variable Speed (VE) Off-Road and Stationary Use** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twenty-four (24) months or 3,000 hours, whichever occurs first (with the first twelve (12) months at unlimited running hours). In addition to the base engine warranty, the following base engine components are warranted for an additional twelve (12) months or a total of 12,000 operating hours, whichever occurs first: cylinder block, crankshaft, intake manifold, exhaust manifold, fresh water pump housing, flywheel, flywheel housing, front transmission cover, oil pan, and connection rod forging. During the second year of the warranty period, warrantable parts that are progressively damaged by non-covered parts are not covered by this warranty.

**Prime Power Use (GE Gen Set Prime Power)** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twelve (12) months with no hour limitation. In addition to the base engine warranty, the following base engine components are warranted for an additional twelve (12) months or a total of 12,000 operating hours, whichever occurs first: cylinder block, crankshaft, intake manifold, exhaust manifold, fresh water pump housing, flywheel, flywheel housing, front transmission cover, oil pan, and connection rod forging. During the second year of the warranty period, warrantable parts that are progressively damaged by non covered parts are not covered by this warranty.

**Stand-by Use** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twenty-four (24) months or a total of 1,000 operating hours, whichever occurs first. In addition to the base engine warranty, the following base engine components are warranted for an additional twenty-four (24) months or a total of 3,000 hours, whichever occurs first: cylinder block, crankshaft, intake manifold, exhaust manifold, fresh water pump housing, flywheel, flywheel housing, front transmission cover, oil pan, and connection rod forging. During the third and fourth years of the warranty period, warrantable parts that are progressively damaged by non covered parts are not covered by this warranty.

**Fire Pump Use** - Volvo Penta of the Americas, Inc., warrants that new Power Systems packages will be free from defects in material or workmanship for a period of twenty-four (24) months or a total of 1,000 operating hours, whichever occurs first.

Warranty travel time coverage is limited to 500 miles and 10 hours per repair from the nearest servicing Volvo Penta Power Systems Distributor or Dealer.

The warranty commences on the date of delivery to the first retail purchaser, from the date put into service as a dealer demonstrator, the date first placed in rental service, or on the first day of the 25<sup>th</sup> month from the date of shipment from Volvo Penta, whichever occurs first, and applies only to warranted defects first arising and reported to Volvo Penta or one of its authorized service dealers during the applicable warranty period. During the warranty period, the warranty is transferable to subsequent owners. Volvo Penta products are eligible for this warranty coverage only if registered with Volvo Penta. Submission of the warranty registration in Volvo Penta's Product Center or other suitable, dated, proof of purchase is required for registration and to obtain warranty coverage. A copy of the registration from the Product Center can be printed out by a Volvo Penta dealer.

Any part of the Volvo Penta engine that is covered by this warranty and that is found in the reasonable judgment of Volvo Penta to be defective in materials or workmanship will be repaired or replaced at Volvo Penta's option. If a problem occurs, the owner must contact an authorized Volvo Penta Power Systems Distributor or Dealer as soon as possible. All repairs (except for those listed under *What is Not Covered by the Warranty*) will be made by the authorized Volvo Penta Power Systems Distributor or Dealer at no charge during the warranty period. Repairs will be made within a reasonable period of time during the dealer's normal business hours. Parts replacement will be made using genuine new or remanufactured Volvo Penta parts. Volvo Penta's responsibility in respect to warranty claims is limited to making the required repairs or replacements. Parts used in repairs under this warranty will assume the identity of the warranted part being replaced and are entitled to the remaining coverage hereunder.

***LIMITATION AND DISCLAIMER OF IMPLIED WARRANTIES OF  
MERCHANTABILITY AND FITNESS***

**TO THE EXTENT PERMITTED BY APPLICABLE LAWS:**

1. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF MERCHANTABILITY AS TO ANY PRODUCT OR PART, WHETHER OR NOT THAT PRODUCT OR PART IS COVERED BY ANY EXPRESS WARRANTY CONTAINED HEREIN;
2. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF;
3. IN THOSE JURISDICTIONS WHERE IMPLIED WARRANTIES MAY NOT BE DISCLAIMED, ANY IMPLIED WARRANTY IS LIMITED IN DURATION TO THE DURATION OF THE EXPRESS WARRANTIES DESCRIBED IN THIS WARRANTY STATEMENT. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.
4. THE REPAIR OR REPLACEMENT OF PARTS OR THE PERFORMANCE OF SERVICE UNDER THIS WARRANTY DOES NOT EXTEND THE LIFE OF THIS WARRANTY BEYOND ITS ORIGINAL EXPIRATION DATE.

### ***What is Not Covered by the Warranty***

- This warranty does not cover Bosch fuel injection equipment or Bosch electrical components. These items are warranted separately by the Robert Bosch Corp.
- This warranty does not cover any Volvo Penta product that has been subject to misuse, neglect, accident or that has been improperly installed, operated, or maintained.
- This warranty does not cover Volvo Penta product sold or transferred as part of an AS IS transaction without warranties.
- This warranty does not apply to any damage that is the result of rust, corrosion, or prolonged or improper storage.
- This warranty does not cover any Volvo Penta product that has been altered or modified so as to adversely affect its operation, performance or durability or that has been altered or modified to change its intended use.
- This warranty does not extend to repairs made necessary by normal wear and tear, or by the use of parts, accessories, lubricants, or fuels which, in the reasonable judgment of Volvo Penta, are either incompatible with the Volvo Penta product or adversely affect its operation, performance, or durability.
- This warranty does not cover travel or transportation exceeding 500 miles and 10 hours travel time per repair from the nearest servicing Volvo Penta Power Systems Distributor or Dealer.
- This warranty does not cover charges for fuel or lubricant usage, rental costs of any type, removal from or reinstallation of the product, or excessive time necessary to gain service access.
- This warranty does not cover other incidental or consequential expenses including loss of use of the engine, loss of income, or inconvenience.
- Covered parts that are damaged from non-covered parts are not covered by this warranty.
- This warranty does not cover pre-delivery inspection labor and any parts expense.
- This warranty does not cover first service inspection labor and any parts expense.

### ***Owner's Responsibility***

As the Volvo Penta Power System owner, you are responsible for the performance of the required maintenance listed in your operator's manual. Volvo Penta recommends that you retain all receipts covering maintenance on your engine. This record of proper maintenance may be required to determine warranty coverage on certain repairs and should be transferred to each subsequent owner. While Volvo Penta cannot deny warranty coverage solely for the lack of receipts or your failure to ensure the performance of all scheduled maintenance, Volvo Penta may deny coverage if your Volvo Penta engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your Volvo Penta product to a Volvo Penta authorized distributor or dealer as soon as a problem exists and use all reasonable means to protect the product from further damage. The warranty repairs will be completed in a reasonable amount of time.

If you have any questions regarding your warranty rights and responsibilities, you should contact Volvo Penta Consumer Relations, Volvo Penta of the America's, 1300 Volvo Penta Drive, Chesapeake, VA 23320. Our telephone number is 1-866-273-2539.

### ***Other Information***

This warranty is only valid for products type-approved for conformity with US EPA or California ARB regulations. The warranty (if any) for Products without US EPA or California ARB type-approvals operated outside these areas is described in the AB Volvo International Warranty statement. Copies of the International Warranty Statement are available from Volvo Penta Consumer Relations.

Note: Outside the U.S. and Canada, there may be additional charges based on local practices and conditions. These charges may include, but are not limited to; freight, insurance, taxes, import duties, and/or other financial charges, including those levied by local governments and their respective agencies. These charges are not covered by the Volvo Penta Limited Warranty and are the responsibility of the retail purchaser.

Volvo Penta reserves the right to change or improve the design of any Volvo Penta product without assuming any obligation to modify any Volvo Penta product previously manufactured.

***In certain areas, this product may also be covered by an emissions system warranty. Please refer to the emissions system warranty statement supplement. Copies may be obtained from Volvo Penta Consumer Relations at the address on page two of this document.***

### ***REMEDIES AND EXCLUSION OF CERTAIN DAMAGES***

Any part of the Volvo Penta engine or power system that is covered by this warranty and that is found in the reasonable judgment of Volvo Penta to be defective in materials or workmanship will be repaired or replaced at Volvo Penta's option. If a problem occurs, the owner must bring the product to an authorized Volvo Penta Service Dealer in a timely manner. All repairs (except for those listed under *What is Not Covered by the Warranty*) will be made by an authorized Volvo Penta Service Dealer at no charge during the warranty period. Repairs will be made within a reasonable period of time during the dealer's normal business hours. Parts replacement will be made using genuine new or remanufactured Volvo Penta parts. Volvo Penta's responsibility with respect to warranty claims is limited to making the required repairs or replacements. All parts will be shipped via standard ground methods. Engines or parts provided under this warranty assume the identity of the engine or part being replaced, and are entitled to the remaining warranty coverage only.

**THE REPAIR AND REPLACEMENT REMEDIES DESCRIBED IN THIS WARRANTY STATEMENT ARE THE OWNER'S SOLE AND EXCLUSIVE REMEDY. IN NO EVENT SHALL VOLVO PENTA BE LIABLE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

**THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY. THE TERMS, LIMITATIONS AND DISCLAIMERS CONTAINED IN THIS LIMITED WARRANTY, AS WELL AS THOSE DOCUMENTS PREPARED IN CONJUNCTION WITH THE SALE OF VOLVO PENTA PRODUCTS, MAY NOT BE MODIFIED, ALTERED, OR WAIVED BY ANY ACTION, INACTION OR REPRESENTATIONS, WHETHER ORAL OR IN WRITING, EXCEPT UPON THE EXPRESSED, WRITTEN AUTHORITY OF A MANAGEMENT LEVEL EMPLOYEE OF VOLVO PENTA.**



Volvo Penta of the Americas, LLC

1300 Volvo Penta Drive  
Chesapeake, VA 23320  
757.436.5100

## REPLACEMENT PARTS AND ACCESSORIES LIMITED WARRANTY

### *What is Warranted*

Volvo Penta of the Americas, LLC warrants that all new or factory remanufactured parts and accessories sold and installed by an authorized Volvo Penta Dealer or Distributor will be free from defects in material or workmanship for a period of two (2) years from the date of sale with the following hour limitations: Industrial products, prime power and VE 3,000 hours, Industrial Products "Stand-by" and fire pump 1,000 hours.

Volvo Penta of the Americas, LLC warrants that all new or factory remanufactured parts and accessories sold by, but not installed by, a Volvo Penta Dealer or Distributor will be free from defects in material or workmanship for a period of one (1) year from the date of sale.

Volvo Penta of the Americas, LLC warrants that all new parts and accessories sold and installed by an authorized Volvo Penta Dealer, Distributor, or Original Equipment Manufacturer (OEM) as part of an engine package, and installed prior to hand-over to the end-customer, will be free from defects in material or workmanship for a period of two (2) years from the date of commissioning (delivery) of the Product and will carry the same hour limitations as the applicable new-product warranty.

The warranty commences on the date the part or accessory is first sold or installed by an authorized Volvo Penta Dealer or Distributor, or if installed in new equipment by an Original Equipment Manufacturer, the date of first retail purchase or from the date put into service as a demonstrator and applies only to warranted defects first arising and reported to Volvo Penta or one of its authorized service centers during the applicable warranty period. During the warranty period, the warranty is transferable to subsequent owners. Suitable dated proof of purchase such as a retail receipt or work order is required to obtain warranty coverage.

Parts used in repairs under this warranty will assume the identity of the warranted part being replaced and are entitled to the remaining coverage hereunder.

### **LIMITATION AND DISCLAIMER OF IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS**

#### **TO THE EXTENT PERMITTED BY APPLICABLE LAWS:**

- 1. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF MERCHANTABILITY AS TO ANY PRODUCT OR PART, WHETHER OR NOT THAT PRODUCT OR PART IS COVERED BY ANY EXPRESS WARRANTY CONTAINED HEREIN;**
- 2. VOLVO PENTA DOES NOT MAKE ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF;**
- 3. IN THOSE JURISDICTIONS WHERE IMPLIED WARRANTIES MAY NOT BE DISCLAIMED, ANY IMPLIED WARRANTY IS LIMITED IN DURATION TO THE DURATION OF THE EXPRESS WARRANTIES DESCRIBED IN THIS WARRANTY STATEMENT. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.**
- 4. THE REPAIR OR REPLACEMENT OF PARTS OR THE PERFORMANCE OF SERVICE UNDER THIS WARRANTY DOES NOT EXTEND THE LIFE OF THIS WARRANTY BEYOND ITS ORIGINAL EXPIRATION DATE.**

### *What is Not Covered by the Warranty*

- Volvo Penta parts that were sold as part of an engine or power systems package.
- any Volvo Penta product that has been subject to misuse, neglect, accident, or that has been improperly installed, operated, or maintained. This warranty does not apply to any damage that is the result of rust or corrosion.
- any Volvo Penta product that has been used for racing or in the preparation for racing; has been altered or modified so as to adversely affect its operation, performance or durability; or that has been altered or modified to change its intended use.
- any Volvo Penta product sold or transferred in an AS IS transaction without warranties.
- costs to modify fuel systems or other components needed to meet local altitude requirements.
- repairs made necessary by normal wear and tear, or by the use of parts, accessories, lubricants, or fuels which, in the reasonable judgment of Volvo Penta, are either incompatible with the Volvo Penta product or adversely affect its operation, performance, or durability.
- travel to or from the product or transportation of the product to and from the servicing dealer or distributor; charges for towing, storage, fuel or lubricant usage, premium (air or overnight) freight charges; rental costs of any type; and excessive time necessary to gain service access, or any other incidental or consequential expenses including loss of use of the engine or drive train, loss of income, or inconvenience.

- labor charges for removal or reinstallation of the failed part or accessory unless the part or accessory was originally installed by an authorized Volvo Penta Dealer, Distributor or Original Equipment Manufacturer.
- Covered parts that are damaged by non-covered parts.

### ***Owner's Responsibility***

The operation, maintenance, and care of the Volvo Penta part or accessory must follow the same guidelines established for the engine and power systems package as outlined in the Operator's Manual and are the owner's responsibility. You shall use all reasonable means to protect the Product from further damage. The owner must keep records of all maintenance services performed. This record of proper maintenance and service may be required to determine warranty coverage on certain repairs and should be transferred to each subsequent owner. If you are not sure of the proper maintenance procedures, contact the Volvo Penta Service Department.

If you have any questions regarding your warranty rights and responsibilities, you should contact Volvo Penta at Volvo Penta of the Americas, 1300 Volvo Penta Drive, Chesapeake, VA 23320. Our telephone number is 1-866-273-2539.

### ***Other Information***

This warranty is only valid for products type-approved for conformity with US EPA or California ARB regulations. The warranty (if any) for parts and accessories without US EPA or California ARB type-approvals is described in the AB Volvo International Warranty statement. Copies of the International Warranty Statement are available from Volvo Penta.

**Note:** Outside the U.S. and Canada, there may be additional charges based on local practices and conditions. These charges may include, but are not limited to, freight, insurance, taxes, import duties, and or other financial charges including those levied by local governments and their respective agencies. These charges are not covered by the Volvo Penta Warranty and are the responsibility of the retail purchaser.

Volvo Penta reserves the right to change or improve the design of any Volvo Penta product without assuming any obligation to modify any Volvo Penta product previously manufactured.

To obtain copies of this warranty, please contact Volvo Penta of the Americas, Inc. at the address listed above.

### ***REMEDIES AND EXCLUSION OF CERTAIN DAMAGES***

Any Volvo Penta part or accessory that is covered by this warranty and that is found in the reasonable judgment of Volvo Penta to be defective in materials or workmanship will be repaired or replaced at Volvo Penta's option. If a problem occurs, the owner must bring the part or accessory to an authorized Volvo Penta Dealer or Distributor as soon as possible. All repairs (except for those listed under *What is Not Covered by the Warranty*) will be made by an authorized Volvo Penta Dealer or Distributor at no charge during the warranty period. Repairs will be made within a reasonable period of time during the dealer or distributor's normal business hours. Parts replacement will be made using genuine new or remanufactured Volvo Penta parts. Volvo Penta's responsibility with respect to warranty claims is limited to making the required repairs or replacements. All parts will be shipped via standard ground methods. Labor to remove and replace the part or accessory will only be covered if the part or accessory was originally installed by an Authorized Volvo Penta Dealer, Distributor or Original Equipment Manufacturer.

**THE REPAIR AND REPLACEMENT REMEDIES DESCRIBED IN THIS WARRANTY STATEMENT ARE THE OWNER'S SOLE AND EXCLUSIVE REMEDY. IN NO EVENT SHALL VOLVO PENTA BE LIABLE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

**THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY. THE TERMS, LIMITATIONS AND DISCLAIMERS CONTAINED IN THIS LIMITED WARRANTY, AS WELL AS THOSE DOCUMENTS PREPARED IN CONJUNCTION WITH THE SALE OF VOLVO PENTA PRODUCTS, MAY NOT BE MODIFIED, ALTERED, OR WAIVED BY ANY ACTION, INACTION OR REPRESENTATIONS, WHETHER ORAL OR IN WRITING, EXCEPT UPON THE EXPRESSED, WRITTEN AUTHORITY OF A MANAGEMENT LEVEL EMPLOYEE OF VOLVO PENTA.**



**Volvo Penta of the Americas, LLC**

1300 Volvo Penta Drive

Chesapeake, VA 23320

Ph: 757-436-2800

Fax: 757-436-5152

Email: vpa.warrantyadministration@volvo.com

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## PRODUCT REGISTRATION UPDATE FORM

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This form is to be used to update owner information with Volvo Penta of the Americas in the event of a change of address or transfer of ownership. Mail, fax, or e-mail to the above address.

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*Product Information:*

Engine serial number(s) \_\_\_\_\_

Other components serial number(s) \_\_\_\_\_

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*Request type:*

☐

Change of address

☐

Change of ownership

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*New owner and / or new address information (proof of ownership required):*

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

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*For transfer of ownership only:*

Original owner (if known) \_\_\_\_\_

Reselling dealer (if any) \_\_\_\_\_ Transfer date \_\_\_\_\_

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*Contact in the event additional information is needed (proof of ownership required):*

Contact Name \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_ E-Mail \_\_\_\_\_